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Original Communications.

*THE TREATMENT OF PHTHISIS BY SULPHURETTED HYDROGEN.**

By H. C. Wood, M.D.

IT has not been many years since the faces of patients in a consumptive hospital were merged into a uniform ugliness, each in fact being cased in a mask of greater or less proportion, with various machinery in its centre, which was dignified by the name of a respirator. It is noteworthy that the respirator was armed with germicides or antiseptics, and was to cure consumption antiseptically. Now the destroyer of phthisis germs and the characteristic phenomenon of the pulmonic hospital bids fair to be a caoutchouc bag, a bottle of bad-smelling solution, and a rectal tube and nozzle. Whether this last claimant for therapeutic favor shall, as is not improbable, finally follow the respirator into oblivion or not, is at present uncertain. But the matter certainly is of sufficient importance to require careful treatment at the hands of the THERAPEUTIC GAZETTE.

In 1883, M. Debove, professor at the *Hôpital de la Pitié*, declared in one of his clinical lectures that consumption being due to

* Dr. V. Morel, "Noveau Traitement des Affections des Voies Respiratoires." Paris, 1886. *Gazette Hebdomadaire*, December 17, 1886. *La Semaine Medicale*, July 14, 1886; October, 1886.

the presence of a parasite, the proper treatment of it was the use of a parasiticide. It was left, however, for M. Bergeon (of L'Ecole de Médecine of Lyons) to put into actual practice this suggestion, and on the 12th of July, 1886, he gave his results to the French Academy of Science. He rejected the lungs themselves as the channel through which the parasiticide should find entrance into the system on account of the rapidity of absorption from them, and of the fact that medicines taken up by them are carried immediately in a concentrated form to the right side of the heart, and, moreover, exert in the lung itself a too great local irritant influence. The disagreeable tastes of most of the antiseptics render their administration through the mouth and stomach difficult, whilst the work of Claude Bernard has shown that gaseous substances taken into the large intestine are absorbed with great rapidity and go into the general system. M. Bergeon, led by this train of thought, used various substances, such as chlorine, turpentine, ether, ammonia, and bromine injected into the rectum, but found them all so violently irritating that they had to be abandoned, but at last he discovered that a mixture of carbonic acid and sulphuretted hydrogen was perfectly tolerated by the intestines, if the gases be pure and be unmixed with atmospheric air. Under these circumstances the rôle of the carbonic acid was to act as a diluent to the sulphuretted hydrogen.

The apparatus of M. Bergeon consisted of a caoutchouc bag having a capacity of four or five litres, which was filled with pure carbonic acid and connected with a Wolffe's bottle, which was in turn connected with the tube inserted into the rectum of the patient, so that by compressing the bag the carbonic acid could be forced to bubble through the solution of sulphuretted hydrogen, natural or artificial, in the Wolffe's bottle, and pass into the intestines. The common sulphurous waters, especially Eau de Bonnes or Eau de Challes, were thought by Bergeon to be superior to any artificial waters, but this is probably a mistake.

In the Hôpital Cochin, where the method has been much practised, the following two solutions have been employed:

SOLUTION NO. 1.

℞ Sulphide of sodium, pure, 10 grammes, or 10 parts by weight;
Distilled water, enough to make 100 cubic centimetres, or 100 parts by weight.

One cubic centimetre of this liquid engages exactly ten cubic centimetres of sulphuretted hydrogen when there is added to it one cubic centimetre of the following solution (No. 2):

SOLUTION NO. 2.

℞ Acid, tartaric, 25 grammes, or 25 parts by weight;
Acid, salicylic, 1 gramme, or 1 part by weight;
Distilled water, enough to make 100 cubic centimetres, or 100 parts by weight.

This solution in the Hôpital Cochin is used by an apparatus which, under the directions of Dujardin-Beaumetz, is made by H. Gallante, of Paris, and which, though much more complicated, is no doubt more convenient than the apparatus of Bergeon. A description of this apparatus with figure may be found in *Les Nouveau Remèdes*, November 24, 1886.

By M. Bergeon himself four or five litres of carbonic acid gas, which had been passed through two hundred and fifty to three hundred grammes of the sulphurous mineral water, were thrown into the rectum twice in each twenty-four hours. In the Hôpital Cochin the amount of gas injected varies from one to four litres at each séance. The apparatus used at this hospital is superior to that used in the original method, because it allows a definite amount of sulphuretted hydrogen to be introduced with the gas. The amount of sulphuretted hydrogen used in the Hôpital Cochin is not positively stated, but about fifteen cubic centimetres of the solution of sulphide of sodium (equivalent to one hundred and fifty cubic centimetres of sulphuretted hydrogen) seems to be the amount employed at a séance.

In his original communication, M. Bergeon claimed that the success of this mode of treatment is very rapid and remarkable; it is stated that the cough immediately diminishes, the expectoration lessens or even ceases, the appetite increases, the sleep becomes undisturbed, the fever abates, and the bodily weight greatly increases.

In the discussion before the Société de Thérapeutique, at the meeting of December 8, 1886, Dujardin-Beaumetz confirmed the statements of M. Bergeon, and further said that the amelioration must be due to the sulphuretted hydrogen, as he had repeatedly tried injections of pure carbonic acid without doing good.

The French reports indicate very strongly that the drug acts, not as was originally expected, upon the parasite of phthisis, but upon the inflamed diseased lung-tissue itself, since Dujardin-Beaumetz states that there is no lessening in the number of bacilli in the sputa: moreover, great benefit is obtained in the treatment of cases of simple chronic

bronchial catarrh. This is also confirmed by the studies of M. Chentemesse, of the Hôpital St. Antoine, who affirms distinctly that there is no lessening of the bacilli, and that very marked relief has been afforded to asthmatic patients. Moreover, *no evidence is forthcoming to show that sulphuretted hydrogen is poisonous to the tubercular bacillus.* It is, so to speak, the natural gas of putrefaction, and without definite proof cannot be considered to be even probably inimical to low organic forms.

Dr. James Henry Bemett has published in the *British Medical Journal*, December, 1886, a paper upon Bergeon's method of treatment, in which, however, he adds nothing to our knowledge of the subject, merely stating his own experience in a single case of asthma.

In this city the method of treatment has been used in the Philadelphia Hospital in a large number of cases, especially in the wards of Dr. Bruen. A personal inspection of the result shows that the statements made by the French observers are correct, and there seems to be no doubt that under the treatment there is rapid alteration of some cases of phthisis for the better. In the Philadelphia Hospital the solution at first used contained five grains of the chloride of sodium and five grains of the sulphide of sodium, but at present the strength has been doubled, so that in the Wolffe's bottle, through which the carbonic acid passes, ten grains of each of the chemicals is put. Once charging of the Wolffe's bottle is made to suffice for a number of patients, each of whom receives at each treatment from three to five pints of carbonic acid. It will be seen at once that in this method the amount of sulphuretted hydrogen received by the patient is unknown and variable, and is very small. A personal inspection of the carbonic acid used showed that it is very impure, the odor indicating that it contains sulphurous acid. Chemical testing has shown that the gas coming from the Wolffe's bottle contains sulphuretted hydrogen, the odor of which is also distinctly present. The chloride of sodium in the solution would appear to be superfluous, the carbonic acid reacting directly with the sulphide of sodium. The following formula represents the probable change: $NaS + CO_2 + H_2O = NaCO_3 + H_2S$.

Such is the evidence which I have been able to gather from the experience of others in regard to Bergeon's treatment, and it is sufficient to indicate that we are in the presence of a very important improvement of, or rather a very important addition to, medical therapeutics. It is of vital importance to decide the mode in which the treatment acts. The experiments of Dujardin-Beaumetz show that the carbonic acid is not the active agent, and that the good achieved is produced by the sulphuretted hydrogen. Reasons already assigned are sufficient to make it improbable that the good achieved is the result of any parasiticidal influence. All clinical experience indicates that heredity is in the production of consumption a vastly more important factor than is any poison introduced into the body from without. Only a portion of the medical profession believes in the active contagiousness of phthisis, whilst the experience of any life insurance company affords a firm foundation for the belief in the heredity of the disease. If the bacilli really are the exciting cause of phthisis, the susceptibility to their action must be a more important factor in the production of phthisis than are the bacilli themselves. There is at present, then, no proof that the sulphuretted hydrogen, when it does good in phthisis, acts by killing the bacilli, and there is still less proof that it in any way increases the direct resistive powers of the individual to the action of the bacilli. In some acute and chronic diseases of the skin, local applications of sulphur act with the most astonishing rapidity and effectiveness, and the thought naturally suggests itself that in Bergeon's treatment of consumption good is achieved by the action of the sulphuretted hydrogen upon the inflamed lung-tissue, or in other words, that the plan of treatment is simply a means of making an application of sulphur to the pulmonic mucous membrane and tissue. This thought is not merely of speculative interest, but also of practical importance, for it suggests that the method of treatment will prove of value not only in consumption but in various forms of chronic or subacute affections of the lungs. This is confirmed by what experience we have. Cases of asthma and pulmonic catarrhs have already been quoted in this article as having been published in the French journals, in which the remedy has proven of the greatest service.

I saw in the Philadelphia Hospital one case of asthma with chronic catarrh and emphysema in which the administration of the rectal injections had been followed by the most pronounced relief. In another case, of catarrhal pneumonia with an enormous amount of purulent expectoration, and general symptoms so bad that a fatal prognosis had been given, the administration of the remedy was at once

followed by rapid lessening and even cessation in the purulent secretion, and in a short time by convalescence.

As an important illustrative case, I cite one from my own recent experience. Mrs. L., over 70 years of age, received a severe contusion of the side in a railway accident, which was followed by pleurisy, in turn followed by bronchial pneumonia, with an enormous expectoration. She has been under my care for nearly three months, and though often temporarily benefited by various remedies, had failed to properly respond to the most careful treatment that I could give her. The expectoration remained exceedingly profuse, amounting sometimes to a pint in the course of twenty-four hours, although very irregular. The general symptoms were very bad: sinking spells were frequent and alarming. I finally told the family that she would die, unless the gaseous injections would do something for her. Within forty-eight hours after the use of the gas, the expectoration notably decreased; the expression of the patient's face changed entirely, and at present writing, fifteen days after the use of the sulphuretted hydrogen, she is expectorating not one-sixth the quantity she did formerly, has regained the natural expression of her face and color of her skin, as well as her appetite, and a fair amount of strength, and seems to be convalescent. A notable fact in this case is that the injections of gas relieve in a few minutes the sense of suffocation and sinking the patient formerly felt in the mornings. The secretion of urine was sensibly increased. As tested on three occasions, the subnormal temperature rose 0.4° F. within the half-hour after the exhibition of the gas either by the mouth or rectum.

One difficulty with Bergeon's method of treatment in private practice is the cumbersomeness of the apparatus and the skilled labor required for the preparation of the carbonic acid. A plan which would avoid this and reach the same result in regard to the lung-disease is certainly a desideratum.

According to Gay-Lussac and Thénard, water at 52° Fahrenheit will absorb three times its volume of sulphuretted hydrogen. To prepare this solution, the gas, previously washed with water, is passed alternately through each of two bottles half filled with water; while it is being passed through one, the other is closed with the stopper and shaken, to insure complete absorption; and thus the process is continued till the water is completely saturated. One of the bottles is then completely filled with the liquid, and removed with the mouth downwards. The resulting solution is a colorless liquid, having the odor of putrid eggs, and a sweetish taste. When heated, it evolves the whole of the gas. Bottles containing the solution of sulphuretted hydrogen should be habitually laid upon their side.

A priori, there is no evident reason why this solution, if injected into the rectum in proper doses, should not exert all the influence upon the pulmonic tissue obtained by Bergeon's treatment. I have tried the solution thrown into the rectum, and found it free from any irritant action. The habitual use of injections two or three times a day is, however, very disagreeable to most patients, and the questions naturally arise, Is there any necessity of administering the drug by the bowels, and will not sulphuretted hydrogen water be taken without too much repugnance by the mouth and without nauseating? At the various sulphur springs large quantities of such water are habitually drunk by the patients. Led by such considerations, I have tried the sulphuretted hydrogen water in as many cases as I have been able to get, and so far, when properly given, it has been usually taken readily, and has not disagreed with the stomach. Some persons, however, will not tolerate it at all. The effects upon the disease have seemed to be entirely similar to those produced by the injections. At first a half-ounce, afterwards an ounce, of the saturated solution of the sulphuretted hydrogen should be placed in a tumbler, and two or three ounces of carbonic acid water be run into it from a highly-charged siphon, the whole being drunk while effervescing. This may be given three to five times a day, so that the patient will receive daily between a half-pint and a pint of the sulphuretted hydrogen gas. Injections of gas into the rectum produce in some persons more or less violent attacks of colic, especially if given at a time when the food is well down in the intestinal tract. Thus, in the case of Mrs. L. the night injection caused so much pain that it could not be borne, although the injection in the morning was actually pleasant. The two methods of administration were then combined, the gas injection being given in the morning and the sulphuretted hydrogen water in the afternoon and evening. Within the last forty-eight hours, at Mrs. L.'s earnest request, the gas injections have been entirely abandoned in favor of the exhibition by the mouth. Of course the two methods are simply different ways of accomplishing the same result, and

may be variously combined or substituted for one or another according to the peculiarities of the individual cases within the last day or two.

It is a matter of the greatest importance to fix definitely the dose of sulphuretted hydrogen gas. With the method employed in the Philadelphia Hospital this cannot possibly be done. The solution employed in the Hôpital Cochin, whose formula is given in the first part of this article, seems to be superior to the solution of the chloride and the sulphide of sodium, in affording known quantities of sulphuretted hydrogen. Even with it, however, the chemical reactions are so slow that practically it is scarcely possible to decide how much of the gas is evolved in a brief time. The substitution of sulphuric for tartaric acid would largely obviate this. When the medicine is given by the mouth exact dosage is possible. In Mrs. L. five ounce-doses appeared to be too much. She is now taking three doses daily.

In a recent number of the *British Medical Journal* it is stated that M. Morel affirmed before the Biological Society of Paris that the dose of the gas is twenty-five cubic centimetres. That it is not incapable of doing harm is shown by the experiments of M. Peyron, who injected into the rectum of a dog one hundred and fifty cubic centimetres of a saturated solution of sulphuretted hydrogen in two doses at intervals of three minutes. Symptoms of poisoning began to be manifested within two minutes, and death took place in ten minutes. Another dog died quickly after two injections of the same strength, given at intervals of twelve minutes, while two others, in whom only very small quantities of the gas, or large quantities very much diluted, had been injected, experienced only slight inconvenience, and rapidly recovered. Not long since, in the University Hospital in Philadelphia, about one quart of a mixture containing equal quantities of carbonic acid and sulphuretted hydrogen were injected into the rectum of a patient; within three minutes the man was unconscious and apparently dying. The breathing-rate was one hundred per minute, and the respirations so shallow that they could scarcely be observed. The pulse at once became very rapid and feeble, and even imperceptible at the wrist, while a very marked odor of sulphuretted hydrogen appeared in the breath. Under treatment the symptoms all subsided in about fifteen minutes. The rapidity with which these symptoms developed and with which they subsided indicates that when the gas is thrown into the rectum its effect is very immediate and fugacious, and it is entirely possible that the more continuous influence of rectal injections of the aqueous solution of sulphuretted hydrogen may act better in pulmonic diseases than does the short influence of the gases now administered. Of course poisoning by overdoses of sulphuretted hydrogen is a no more valid objection to its proper use than is opium poisoning to the employment of opium.

1925 Chestnut St., Philadelphia,
April 2, 1887.

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*CUNEIFORM OSTEOTOMY FOR ANTERIOR CURVATURE OF BOTH TIBIÆ AND BOTH FIBULÆ.**

By Milton Josiah Roberts, M.D.†

(Concluded from page 163.)

CLINIC OF OCTOBER 26.

I THOUGHT it might be of interest to you to bring before you to-day the little colored boy upon whom we operated a week ago for the correction of anterior tibial and fibular curvatures. It is always well to know the history of a case subsequent to an operation in order to correctly judge of the value of the operation. An operation may at the time of its performance appear to be a very brilliant one, but in the light of subsequent events may take on an entirely different appearance. You will remember that we performed four cuneiform osteotomies upon this patient, requiring eight complete divisions of the bones of the leg. Fortunately for us, Dr. McNutt was able to provide a bed in the babies' ward for our patient, so that his subsequent condition could be carefully watched. Dr. Vinton, who has had charge of the patient since the operation, reports his condition as follows: October 19, after the operation, at 4.45 P.M., his temperature was $98\frac{9}{10}°$, pulse 89, respiration 30. On October 20, at 4 P.M., his temperature reached 101°, but quickly began to fall. On the 22d inst., the third day after the operation, his temperature fell to normal, and has remained so ever since. There is no indication of any suppuration, the dressings re-

* A Clinical Lecture delivered at the New York Post-Graduate Medical School and Hospital, October 26 and December 18, 1886.

† Professor of Orthopædic Surgery and Mechanical Therapeutics, Visiting Orthopædic Surgeon to the City Hospital on Randall's Island, Consulting Orthopædic Surgeon to the Woman's Hospital, Brooklyn, etc. Phonographically reported by J. J. Sullivan, M.D.

maining perfectly dry and clean. He is now eating and sleeping well, and all his bodily functions seem to be normally performed. We will endeavor to keep this patient under observation, that you may note for yourselves the progress of the case.

Now, with regard to the correction of anterior tibial curves. I know you will hear a great many physicians say it is a perfectly simple matter to overcome these deformities by means of operations performed with the chisel and mallet. I have yet to see, however, the report of any cases in which the deformity was so exaggerated as in this case where it has been completely rectified. You can readily appreciate this when you recall to mind the difficulties which the surgeon must necessarily encounter when he endeavors to remove a wedge-shaped piece from a bone by means of a chisel. At best it can only be accomplished in a bungling and unworkmanlike manner, for a chisel is not the tool with which to remove V-shaped pieces from any hard substance. In any of the mechanic arts a workman desiring to remove a V-shaped piece from any hard substance would never think of resorting to the use of a chisel. Then, again, the jars which are communicated to the bony framework by means of the repeated blows of the mallet upon the chisel are transmitted to the central nervous system, and necessarily are the cause of more or less shock. I have known of more than one patient operated upon for tibial curvature with the chisel and mallet who has lost his life in consequence of the operation, and who, at the time of the operation, was in perfect health. Such disastrous results, however, are not as likely to find their way into medical literature as those of a more pleasing nature.

FIG. 1.

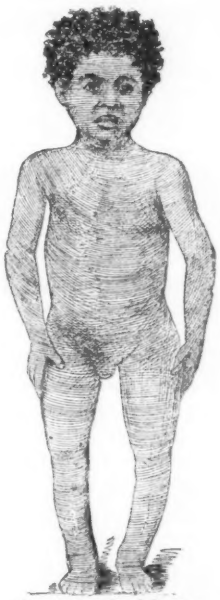
Showing result of operation.

CLINIC DECEMBER 18, 1886.

I have again brought before you the little colored boy upon whom I operated about eight weeks ago, this time with the dressings removed. He has not had an untoward symptom since the operation, and union of the bones and soft parts has taken place without the formation of pus. As you see, when placed in the position in which he was originally photographed, the anterior deformity has been perfectly corrected. (See Fig. 1.) You will remember on the occasion of the operation I directed your attention to the fact that this child presented a double deformity, viz.,

anterior curvature of both tibiæ and both fibulæ, in conjunction with a slight degree of bow-leg deformity. These deformities, the anterior and the lateral, it should be borne in mind, lie in two different planes. In the anterior deformity the right and left plane of the leg is distorted, while in the bow-leg deformity the mesial plane of the leg is distorted.* The anterior deformity of the leg-bones has been perfectly corrected. No attempt, however, was made to correct the bow-leg deformity at the time of the operation. When placed upon his feet (see Fig. 2) you will

FIG. 2.



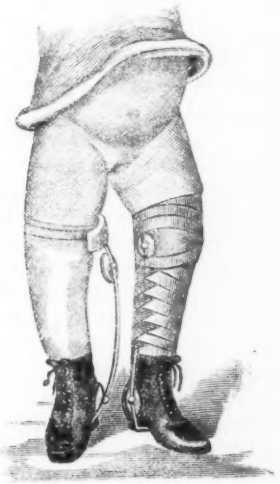
Showing bow-leg deformity.

readily appreciate the persistence of this deformity. And it is to a practical point connected with the correction of deformities lying in two planes to which I wish now to direct your attention.

Had I deemed it perfectly safe to have divided the bones of the tibiæ and fibulæ just distal to their proximal epiphyses, on the occasion of the operation for the correction of the anterior deformity, I could have readily corrected the bow-leg deformity, and he would now have been presented to you with perfectly straight legs. It has not, however, been shown, so far as I am aware, that it is perfectly safe to endeavor to straighten at one sitting a bone which is deformed in more than one plane. The thought which has always deterred me from the multiple cross division of long bones has been the fear of interfering with their nutrition. I am not at all satisfied, however, that it is not feasible to undertake such an operation, but until I have knowledge of its reliability from other sources, I shall not hazard such a procedure upon a living human being. It would be of great practical value to perform a series of experiments upon the lower animals in order to determine the limitations to multiple cross-sections of the long bones. If it can be demonstrated, as a result of these experiments, that we can make a complete section of a long bone in two or more planes without interfering with its nutrition, nothing will be simpler than the straightening of long bones that are deformed in more than one plane. Experiments on living human beings should never be undertaken unless they are legitimate, and experiments only become legitimate when, by means of a rational line of thought, observation, or experimentation, the conclusion is reached that they are feasible. Thus reinforced, we feel confident of the justice of our undertaking, and experimentation then takes on the garb of legitimacy.

What I propose to do in this case, however,

FIG. 3.



Bruce's bow-leg apparatus.

is not now to submit the patient to a second operation for the correction of his bow-leg deformity, but to correct this by mechanical means. For this purpose I shall make use of an extremely simple form of apparatus, the invention of Dr. Charles E. Bruce, one of the assistants to the orthopædic chair in this in-

* Anatomical Geometry and Toponomy, etc.

stitution. This apparatus consists (as will be seen by reference to Fig. 3, right lower extremity) of three pieces, with joints corresponding to the ankle and knee, and is placed upon the inner aspect of the limb. It is made of very light pieces of steel. The first segment of the instrument extends from the sole of the shoe to the ankle-joint, and is riveted directly to the sole of the shoe in front of the heel. The second segment of the instrument is a narrow strip of stiff steel, having a curvature, which approximates in degree that of the deformity to be corrected, only that it is in the opposite direction. The third segment extends a short distance above the joint. It is provided with a curved piece, riveted at right angles to the shaft of the instrument, this curved piece serving to keep the upper part of the instrument in position on the limb. Now a roller-bandage is carried about the limb and over the instrument, the latter being drawn up close to the limb, as shown for the left lower extremity, Fig. 3. Instead of using a roller-bandage to secure the apparatus in position, I prefer to draw on an elastic cap, which extends from a little above the ankle-joint to a point just below the knee-joint. By the use of an elastic cap of this kind much time is saved in applying and removing the apparatus. It is also not so apt as the roller-bandage to get out of position. The curved shaft of the instrument being made of spring steel, and tempered, when straightened out and drawn close to the limb gently tends to return to its former curved form. The pads attached to the instrument opposite the ankle- and knee-joint serve as points of counter-pressure, and tend to straighten the limb. This apparatus should be worn day and night, but it should be removed each day, not only for the purpose of cleanliness, but in order to manipulate the muscles, as the prolonged wearing of bandages, even though the patient exercises considerably, is likely to cause more or less muscular atrophy.

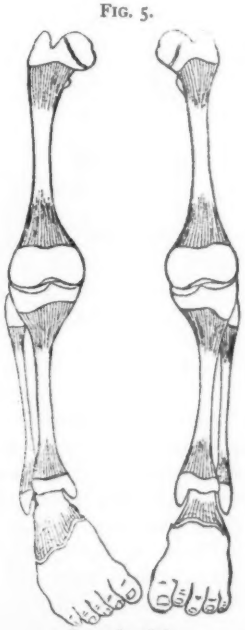
The appropriateness of the idea of applying force in one direction to the shafts of the tibia and fibula, and a counterforce in the other direction to the epiphyses of these bones, as is accomplished by Dr. Bruce's instrument, will be understood when we come to consider the anatomical relationships of the parts involved in bow-leg deformities. Two or three years ago I made some dissections of the limbs of the lower extremities of very young children, which convinced me that in these deformities we must at least not always expect to find the shafts of the tibia and fibula curved outward. Fig. 4 represents the dismembered lower extremities of a

FIG. 4.

Lower extremities dismembered.

child one month old. From an inspection of this figure it would appear that the tibial

FIG. 5.



Same, denuded.

shafts were curved outward. This impression is dispelled, however, when we come to re-

move the flesh from the bones. Fig. 5 represents the bones of the lower extremities, represented in Fig. 4, freed of their soft parts. From an examination of this figure it will be seen that the shafts of the tibiæ and fibulæ are straight. It would appear, therefore, that the deformity was due to a tilting of the epiphyses upon their diaphyses, or to some alteration in the epiphyses.

105 Madison Avenue, New York.

CLINICAL AND PHYSIOLOGICAL NOTES ON THE ACTION OF CANNABIS INDICA.

By Hobart Amory Hare, M.D.*

CANNABIS INDICA has been before the profession for many years as a remedy to be used in combating almost all forms of pain, yet, owing to the variations found to exist as to its activity, it has not received the confidence which I think it now deserves. At present certain improvements made in the method of obtaining the extract from the crude drug have very materially increased its reliability, so that by selecting an article made by a responsible firm we may be fairly sure of receiving a preparation in which we can place confidence. Within a few years this drug has become particularly prominent in connection with its use in migraine, particularly when used in conjunction with gelsemium, although of the two remedies the hemp is by far the most active agent in subduing the pain and preventing other attacks.

Heretofore the profession has used the remedy in such cases purely from an empirical stand-point, but I shall in a moment explain more fully its true physiological action. Aside from this, however, I have certainly seen very severe and intractable cases of migraine successfully treated by this remedy, not only in regard to the attack itself, but by acting as a prophylactic. The best use of the remedy under such circumstances is as follows, in case the drug obtained be fairly active. If the attacks are frequent then the remedy should be used constantly in small doses, in such a way that the patient is not conscious of any influence of the drug, and about ⅜ of a grain of the solid extract may be taken night and morning, or, if this produces any tendency to sleep, the whole amount may be taken at night. At the beginning and during the attack it should be freely administered, until either the pain is diminished or very marked symptoms of its physiological action assert themselves; and that this line of treatment is not one calculated to produce serious results is proved by my own experiments, and by the fact that so far no case of fatal poisoning from its ingestion has been recorded as occurring in the human being.

I myself have taken as much as one grain of the solid extract of a very active preparation without producing any disagreeable symptoms other than that of a deep sleep, which lasted for nearly eighteen hours, preceded by a period of great hilarity, which did not pass into any sensation of dread, such as has been described by some persons.

When gelsemium is used in addition to the hemp, its usefulness is limited only to its action in warding off an immediately impending attack, and I do not believe it possesses much power for good unless it be given when the first symptoms of the malady appear. Its exceedingly poisonous properties necessarily prohibit any repetition of a dose, and for this and the reasons above stated the drug should be administered in one single dose of 15 to 20 drops of the tincture at the first sign of an attack.

Cases of migraine treated in this way, when the disease does not depend on any distinct organic lesion, are in a large proportion of instances either entirely cured or greatly benefited, the attacks even when they recur being considerably farther apart.

In neuralgias depending on a condition of debility in nursing women and in overworked men cannabis indica alone acts very favorably, not by acting in any way as a stimulant to the system, but rather by allaying any irritability of the nerve-trunks. Again, in many cases of irritative cough, depending either upon some nervous irritability or upon some actual irritated condition of the air-passages, cannabis indica will be of service in allaying the troublesome symptom, and is often found useful in the chronic winter cough of old people, provided no great outpouring of mucus or liquid is in the lungs.

In certain stages of phthisis it is a very valuable remedy, not on account of any influence possessed by it on the pathological processes, but by quieting restlessness and anxiety, and by turning the mind of the patient to other channels. Indeed, in cases of advanced phthisis I believe it would be justifiable to push the drug almost to the condition

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known as euthanasia, and this has been done quite frequently by many practitioners. Under these circumstances, the patient, whose most painful symptom has been mental trepidation, may become more happy or even hilarious.

The advantages in its use over that of opium consist chiefly in the absence of prostration and nausea after its ingestion, and in the partial lack of soporific power which it possesses as compared to the opiate, for in certain cases sleep is not always desirable when pain is to be removed. That cannabis indica has, however, marked powers as a soporific is not to be denied. Added to these advantages is the fact of its failure to produce serious symptoms even if very large doses be taken, although I have found the efficient dose of a pure extract of hemp to be as powerful in relieving pain as the corresponding dose of the same preparation of opium.

That it is capable of producing a habit there can be no doubt, although whether its devotees are as devoted as are those of opium I cannot say. In my own practice I have seen a case of a young man who took his first dose as an experiment, and who afterwards had such a constant desire for its repeated use that he was forced to abstain from it entirely. He also said he could readily understand how the drug might have devotees, and that the pleasurable sensations excited were far preferable to those of alcohol.

During the time that this remarkable drug is relieving pain a very curious psychical condition sometimes manifests itself; namely, that the diminution of the pain seems to be due to its fading away in the distance, so that the pain becomes less and less, just as the pain in a delicate ear would grow less and less as a beaten drum was carried farther and farther out of the range of hearing.

This condition is probably associated with the other well-known symptom produced by the drug, namely, the prolongation of time.

Turning from the clinical stand-point of the drug to its physiological effects, we find that its clinical uses rest on a scientific basis, and I shall, therefore, detail one or two experiments showing in what manner the drug acts.

If a considerable quantity (♏x)* of the fluid extract be given to a twenty-pound dog, by the jugular vein, in the course of two or three minutes he becomes very playful and happy, and gambols over the floor. In the course of about five minutes more there appears a slight stagger in the walk, which gradually increases, and is most marked in the fore legs, the condition of mental exhilaration continuing. Soon after this equilibriation is partly lost, for the animal, sitting on its haunches, places its fore feet wide apart; nevertheless, in the course of ten minutes more he seems to partially recover his balancing powers, and to be as happy and frolicsome as ever, barking and running. In the course of twenty or twenty-five minutes more he vomits, and the swaying and staggering reassert themselves, now affecting both hind and front legs. This condition rapidly passes into a drowsy state, which, in turn, deepens into profound sleep, from which it is difficult to arouse the animal to consciousness, although the reflexes are markedly accentuated, particularly to sounds. This sleep lasts for many hours, and finally the dog wakes up himself again. In some instances a lack of co-ordination, due evidently to failure of sensation, appears, so that the animal places his feet on the floor as if it were uneven, or higher or lower than it is.

That the drug may be given in enormous amounts by the jugular vein in the dog without producing death is proved by the fact that I have injected as much as 10 c.c. of the fluid extract without producing serious symptoms. Thus, at 1.20 P.M. the injection was given. At 1.25 the dog was sound asleep and groaning, as if having bad dreams. At this time pinching the ear called out no sign of discomfort, and the respirations were eight per minute.

At 5 P.M. the animal was as sound asleep as before, but was unfortunately killed by the laboratory assistant, owing to a misunderstanding of my orders. Just before death the respirations had risen to ten per minute, and several movements had been made by the dog.

Again, I have given by the jugular vein 22 c.c. of a fluid extract, which I knew to be active, without producing death or any marked change in either arterial pressure or pulse-rate, as may be seen from the following condensed table:

DOG; ETHERIZED; WEIGHT, 40 POUNDS; FULL GROWN.

Time.	Drug.	Pressure.	Pulse.	Remarks.
3.01.10	.....	114–144	186	
3.01.20	.....	114–142	180	
3.01.30	.....	116–142	192	
3.01.40	2 c.c.	144–100	192	Injection begun.
3.01.56	.....	86–136	198	Injection ended.

* ♏viii of this preparation is the dose by the mouth for an adult man.

Time.	Drug.	Pressure.	Pulse.	Remarks.
3.02.06	.....	118–154	168	
3.02.16	.....	134–154	150	
3.02.26	.....	132–150	162	
3.07	.....	126–138	156	
3.09	.....	126–142	144	
3.09.10	.....	126–140	146	
3.09.20	.....	126–142	144	
3.09.38	.....	128–148	150	Vagi cut in order to determine if the slowing was due to pneumogastric stimulation.
3.09.48	.....	136–164	168	
3.11	.....	134–166	180	
3.12	.....	168–194	162	
3.12.23	5 c.c.	168–190	150	Injection begun.
3.12.35	.....	110–190	162	Injection ended.
3.12.45	.....	78–112	162	
3.13.05	.....	164–178	180	
3.13.25	.....	176–184	162	
3.25	.....	154–172	186	
3.35	.....	148–170	162	
3.37	.....	148–168	180	
3.37.12	8 c.c.	162–174	144	
3.37.22	.....	166–88	132	
3.37.32	.....	56–84	156	
3.39.00	.....	88–136	180	
3.41.10	.....	126–156	174	
3.41.20	.....	126–150	174	
3.41.37	7 c.c.	138–150	144	Injection begun.
3.41.42	.....	136–154	138	Injection ended.
3.41.52	.....	148–118	168	
3.42.02	.....	90–140	150	
3.42.12	.....	104–70	168	
3.42.22	.....	98–68	156	
3.42.5	.....	88–116	96	
3.44	.....	118–92	102	
3.44.16	10 c.c.	98–124	105	Injection begun.
3.44.20	.....	74–146	88	
3.44.40	.....	54–34	96	
3.45	.....	28–24	66	
3.45.10	.....	26–22		Pulse imperceptible; heart stopped; respiration continued for ninety seconds after heart.

The only influence exercised on the circulation by the drug consists, as is seen by the above table, in a slight slowing of the pulse and fall of arterial pressure. That the slowing is due to direct cardiac depression and not to stimulation of the vagal centres is proved by the failure of the pulse to return to its normal rate when the vagi were cut. The fall in arterial pressure seems to depend entirely on the failure of cardiac power.

The 22 c.c. were given between 3.01 and 3.41, in four doses, ranging from 2 to 8 c.c. At 3.44 10 c.c. more of the extract was given rapidly into the jugular, producing death in about sixty seconds. In other words, it required 32 c.c. of the strong fluid extract, by the jugular vein, to produce death in a dog weighing forty pounds.

When we consider that this extract was active in doses of ♏viii to man, it must be conceded that this drug has but slight lethal power.

Respiration continues after the heart ceases to beat in those cases in which the drug is sent into the cardiac apparatus *en masse* through the jugular vein; but when death is not due to this cause, there seems to be a simultaneous failure of heart-power and respiration.

The action of the drug on the nervous system is, of course, the most interesting part of the investigation, and we find that in the frog, as in the dog, the greater portion of its action is on the brain.

When a very large dose of the fluid extract (♏v to ♏xx) is given hypodermically to the frog, it immediately becomes quiet, and in a moment or two will lie flat on its back, apparently in a deep sleep, with slow and full respirations. That the condition of relaxation is due to sleep or cerebral depression was proved by oft-repeated experiment, reflex action being increased very markedly, proving that the motor and sensory nerve-trunks were unaffected, as well as the motor and receptive centres in the cord. Reflex action, however, rapidly diminishes after remaining for five to ten minutes, and total relaxation comes on. That this is not due to motor-nerve or spinal palsy is proved by electric stimulation of the cord and nerve-trunks, which is always followed by contractions of the tributary muscles. The loss of reflex power, therefore, must depend on depression of the sensory apparatus, and further experiment confirms this reasoning, for, as was again and again proven, the drug, when applied locally to the exposed sciatic, invariably prevented the passage of the most powerful impulses from the foot to the cord. The poisoned foot could be burnt off without any response, while if the opposite leg was burned the batrachian instantly leaped away, using both the poisoned and unpoisoned leg, showing again that cannabis indica does not have much effect on the motor nerve-filaments even when directly applied to them. Under these latter circumstances, however, the poisoned leg is not moved quite as rapidly as its fellow, showing that the motor nerve has not escaped absolutely the direct application of the drug. That the sensory tract of the cord is affected was proved by tying the common iliac in order to protect the nerve-trunks of the posterior extremities, and then injecting the poison into the body. Under these circumstances there is, as usual, the first stage

of heightened reflex action, followed by corresponding depression of the same, and irritation of the protected sensory nerve fails to call forth any response from the spinal cord.

To summarize these conclusions, we find that cannabis indica produces in the lower animals a period of happiness followed by more or less deep sleep, according to the amount of the drug. That in both the dog and frog we have a stage of heightened reflex action following the dose.

That this increased reflex action is replaced by reflex palsy which is not due to motor-nerve or motor-spinal-tract palsy, but to failure of the sensory side of the cord and nerve-trunks.

That the chief action of the drug is upon the centres in the cerebrum, that the action on the sensory tract of the spinal cord and nerve-trunks is secondary to its cerebral action.

Before closing this paper I desire to call the attention of practitioners to the local anæsthetic action of this curious substance. As already detailed, when applied directly to the nerve-trunks it paralyzes them, and I have found that when applied to the mucous membrane of the tongue in considerable quantity it diminished sensibility to a considerable degree. Dentists, I am told, constantly use it for sensitive dentine. The drug is too irritating to be used on delicate membranes such as the eye, for I have proved in the dog that it is apt to bring on severe inflammation.

CURIOSITIES OF THERAPEUTICS.

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I. PRIMITIVE AND PSYCHO-PHYSICAL MEDICINE.

IN no way is mental evolution better exemplified than by comparison of the intellectual processes that have lifted Therapeutics from a superstition of mere barbarism to rank as a definite science. Among all early peoples we find medicine to have been intimately interwoven with those mental phenomena that procure Psychomancy: it was occult, hence a factor of religious belief developed by contemplation of the unknown mysteries of Life and Death. The same also obtains among the primitive races of the present, and the *Shams* of Kalmucks, Jakuts, and Ostiaks; *Tadibes* of Samoijedes, Tchuktchi, and Tungusi; *Hantus* of Malays and Dyaks; *Angekos* of Esquimaux and Innuits; *Fetiches*, *Voudoos*, and *Obi-men* of negroes; and *Powahs*, *Tlaquillahs*, *Wicaste-Wakans*, "*Spirit*" and "*Medicine-men*" of Indians;—all are exponents of therapy, at the same time exercising semi-sacerdotal functions. The same is in some degree true also of enlightened nations, as Mohammedan *Hakims*, Hindu *Brahms*, Buddhist *Bonzes*, etc., profess equal readiness to minister to a body diseased or soul disordered.

The Psychomancy of the North American savage, which, for personal reasons, is selected as a type, is universally known under the pseudonyme of *Medicine*, a term as inappropriate as it is misleading, and adopted doubtless through inability to comprehend the subtleties of a strange tongue; an error that results from the accordance to primitive people, the same mental *calibre*, and general associations of ideas, as pertain to advanced civilization and development. Medicine as a science finds no equivalent in any savage tongue,* and the words so translated have reference solely to the occult, mysterious, magical, and supernatural. *Medicine*, in the sense used, is of broad significance and varied application, embracing *psychology*, *clairvoyance*, *ecstasism*, *spiritism*, *divination*, *demonology*, *prophecy*, *necromancy*, and all things incomprehensible, consequently a true *Shamanism*;† it is the primitive philosophy of life and matter, and comprehends the *animate* and *inanimate*, *organic* and *inorganic*, *absolute* and *imaginary*. It holds the entire universe is permeated by spirits or essences more or less human in character, who determine the fortunes of men and operations of Nature,‡—familiars controlled by no fixed laws and in the main irresponsible, yet holding some occult and indefinable relationship one to another and to one Supreme Power, who figures under a variety

* For instance, the famous "*Medicine Dance*" of the Dacotahs is by them termed *Wacipi-Wakan*, literally "Dance of Spirits." *Econg-Wakan*, rendered "*medicine-making*," is properly "conjuring with spirits." *Wicaste-Wakan*, far from being "*Medicine-man*," should be translated "One Familiar with Spirits," and the same is employed to designate the civilized clergyman or missionary. The white physician, or the surgeon at the agency and military post, is known as *Pizihuta-Wicaste*, or "One Familiar with Herbs" or vegetable growths. So, too, the Ojibbewa or Otchipwe *maskiki*, far from being "medicine," has no other significance than the Dacotah *pizihuta*.

† A word derived from the Jakut through the Russian, and adopted by lexicographers as a synonyme for polytheistic myths.

‡ See Livingstone's "Zambesi," pp. 545 to 547.

of titles and guises, according to vagaries of race and language.*

The theory whereby inanimate and inorganic objects are endowed with familiars, pertains to all primitive peoples, and it is this that requires the belongings of the warrior to accompany him to the grave in order that he may have the phantoms thereof secured to him in his life beyond.† In this the spiritism of the savage is more consistent and complete than that of civilization. Shakespeare describes the ghost of Hamlet's father as wearing his "beaver up," and the primitive man sees no reason why a helmet should not possess a spirit as well as the warrior who places it upon his ghostly head; and in the New Zealand tale of Te-Kanawa we see the same exemplified, in that the hero devoted his personal ornaments to the spirits, who removed the essences, but left to him the substance.

Again, the impalpable essences of inanimacy may, and do, separate, appearing at considerable distances from their substances; and if the latter are broken, worn out, or destroyed, the spirit is no way affected thereby.‡ It is this philosophy that causes the savage to devote only his effete belongings to the service of the unknown, as exemplified by beads, bits of tobacco, fragments of cloth, furs, skins, ribbands, etc., that, suspended from wands, bushes, or trees, or displayed upon rocks, ledges, and knolls, greet the vision of the traveller everywhere in the Indian country. Dreams, too, are regarded as real events, wherein the soul or spirit, voluntarily or involuntarily, leaves the body. Trances and catalepsies are wholly involuntary, and procured by the more powerful *manits* for some express purpose of their own; and death and sleep differ only in degree and in permanency.

Spirits are good, bad, and indifferent, as the case may be, the two latter, of course, greatly preponderating. The good receive no placatory offerings, and require little attention, since their acts, influences, and purposes are obviously for the best. The evil, on the contrary, demand constant supervision and flattery, lest the smooth workings of Nature be interfered with and the normal destinies of man perverted. Again, the evil genii exhibit all the passions of humanity: some are bold, persistent, revengeful, malevolent beyond all comprehension, and but sparingly amenable to human influences; others, again, are weak, mild, vacillating, indifferent, easily satisfied. *Ni-ni-bon-jour*, or *Ninibonzech*, the "Wind-Genii" of the Otchipwes, though of the former class, was once included among the latter. Having become soured by the punishment incurred through the displeasure of *Kitche-Manito*,§ he is no longer to be depended upon with any degree of certainty. *Pah-ah-*

* *Manit*, *Manito*, or *Manitou* is not a universal appellation, as supposed, but peculiar to the Algonkin races; neither does it pertain to the *Supreme Power* alone, since it is *generic*, and equally applicable to all spirits. *Kitche-Manito*, however, is the "Great Spirit" of the Otchipwes, as *Oui-wis-i-manito* is of the Shawnees. *Wakan-Tanka* is the "Chief Spirit" of the Dacotahs; *Pah-ha-shun* of the Kiowas; *Ah-ho-ki-tou* of the Pawnees; *Yehl* of the Thlinkets; "*Old Man*" of the Blackfeet; "*Boy in the Moon*" of the Chepwyans; etc.

† In this connection may be traced the history of funeral offerings from its source in a crude savage philosophy down to a mere formality or symbolism. The ancient Aryan placed the implements of the individual in the grave that they might serve him in the future life. The modern Hindu has so far progressed as to lay a bit of yarn upon the funeral-cake, saying, "May this apparel be acceptable (or serve thee)." Ovid tells us that in his time the offerings had been merged into an affectionate and sentimental ceremony to appease the shades, —a sprinkling of flowers, corn, and salt:

> "Parva petunt manes—pietas pro divite grata est
> Munere. Non avidos Styx habet ima deos."

The early Christians buried clothing and ornaments, and playthings and toys with children, exactly as do the Dacotahs, Crees, Otchipwes, Assinoboines, and other red races to-day. The Finns, Lapps, and Chinese provide their dead with money and apparel; and the latter annually spread a feast to banquet the souls of the departed, allowing sufficient time for the phantoms of the food to be removed, when they themselves devour the substance. Precisely the same superstition obtains in many civilized districts; and in Brittany, on the eve of *Fête des Morts*, the fire is made up, the hearth swept, and the table laden with delicacies to feast the manes of departed friends. And, when we see wreaths and flowers laid upon the tomb or coffin, or strewn within the open grave, we recognize the act as a relic of the crudest savage psychomancy, and an offering, changed in signification, it is true, but nowhere broken in historical sequence.

‡ A peculiarity of primitive theogony is that a spirit may retain individuality while yet disseminating itself in various forms, and may demand placation in each and all. Thus the Game God of the Otchipwes is ever *himself*, at the same time his spirit partakes of as many forms as there are creatures in his domain. It will be observed that the doctrine of Trinity is by no means so new as imagined.

§ He fell into evil courses, owing to the privilege he possessed of appearing in human form. One cold day, overcome by *ishkodewauboo* ("fire-water"), he lay down upon the cliffs that form the entrance to Thunder Bay Harbor, Lake Superior, and fell asleep. *Kitche-Manito*, discovering him in this disgraceful condition, became greatly angered, and drove his spirit to its home in the mysterious "Wind Mountains" that form the "divide" between the Lake and Hudson's Bay, and incorporated his human frame with the rocks; and his gigantic form can still be seen limned in the outline of the adjacent mountain ridge.

kuk, his younger brother, also known as *Michabo*, "The Great Hare," appears in somewhat better light, though he too is wont to be capricious. He is the analogue of the "*Brer Rabbit*" of negro folk-lore, and the Genii of Game, and through familiars, which are but essences of himself, he controls the lives of all creatures of fur, fin, and feather, arranging their migrations, breedings, and habits in consonance with his own will. The haze of Indian summer is the smoke exhaled from his pipe preparatory to winter hibernation. The brothers are greatly feared, the elder especially so, since he retains the elements within his grasp; and it is essential both should be constantly appeased and placated.

Another peculiarity of psychomancy and primitive theogony is, that no portion of the universe is exempt from familiars. Every cañon, rock, hill, mountain, lake, or stream has its individual spirits or groups of spirits, and much that is grand and picturesque in Nature, or of economic value to man, is denied the savage by reason of his superstitions. The beautiful Lake of the Woods, the pellucid Nipigon, and the northern shores of Georgian Bay and Lake Superior with their contiguous islands, abound with grewsome localities; and thousands of spots throughout the water-ways of the great Northwest are regarded with awe, and avoided as if breeding pestilence. Along the west shore of Lake *Ounipeg* (Winnepeg), especially in the vicinity of Limestone Cave Point, are numberless weird and gloomy caverns, that are deemed abodes of spirits of untold malignancy. Steep Rock, on Lake Manitoba, and the valley of *Katapaywie-Sepe* (Qu'Appelle River),* are the dwelling-places of "*Little Men*,"—creatures half a yard high, with hydrocephalic heads and hair sweeping to the ground, that are ever lying in wait for unwary humanity.† Manitoba Island, in the lake of like name, is supposed to be the home of a tribe of *manits* of great power and phenomenally capricious motives, on account of the sounds that are heard proceeding from it as the result of waves washing the limestone shingle of the beach, the rock beneath being honeycombed with caverns.‡ No savage foot ever ventures to press this lovely islet, or to land upon any of the demon-haunted shores of this region, save as forced thereto by accident or stress of weather. Passing canoes keep as far away as wind and wave will permit, and if driven to the strand, the unfortunates, as the occupants of these frail barks deem themselves, hasten to placate the spirits resident at the expense of the contents of their tobacco-pouches.

Also there are acts, objects, or events mysteriously linked with the fortunes of tribes and individuals that are *Shaman*, or, as it is vulgarly termed, "*medicine*," and often emblematic rather than spiritual as viewed from a civilized stand-point, though the reverse obtains in savage minds; such are calculated, among other objects, to inculcate and perpetuate unity of tradition and purpose. Thus, the grand war council of the Dacotahs, formerly a confederation of thirteen tribes and nearly or quite twenty thousand warriors, promulgated a national *Shaman*, that required a redstone pipe, with stem of ash, to be smoked at all deliberative gatherings, the real significance of which was *undying hostility to whites*.§ The Crows, or *Upsaraukas*, will not sit in council unless the pipe rests upon a dried bison "chip," and is lighted by means of a live coal of the same excrementitious material; but of what this is emblematic, remains a profound secret to this hour. Also an endeavor was made to engraft teetotalism upon their

* The Cree tradition is that an Indian descending the stream in a canoe heard a loud voice calling among the cliffs. Listening, he heard it again as before. Shouting a reply, an answer was elicited, and though he landed and searched the rocks, neither person nor footprints could be found. From that time forth the river has been known as *Katapaywie-Sepe*, or "Who calls?" which the *voyageurs* render as *Qu'appelle*. No savage can understand that waves of air may be turned back, reflected, and sound duplicated in echo. He knows not there is an atmosphere, and to him such reverberation must needs be the voice of the unknown and unseen, consequently *spirits*.

† "Little Men or People" are supposed to be very expert in the use of minute arrows, and a sciatica, or other mysterious pain, is often laid at their door. The same ideas formerly pertained to the mounds of the White Stone River near its junction with the Missouri.

‡ Mr. H. Youle Hinde likens the sound to "beautiful but melancholy reverberations of far-off church-bells." The same may be observed, and from like cause, among some of the limestone islands of western Lake Erie, but the tones are less sweet or distinct.

§ Mr. John Mason Browne, a gentleman from long residence among the tribes of the upper Missouri thoroughly familiar with Dacotah character, as long ago as 1865, said, "The prediction may be safely ventured that the Sioux will preserve this '*medicine*' until the nation shall have practically ceased to exist. To it may be traced the Indian war that devastated Minnesota in 1862; and there cannot, in the nature of things, and of the American Indian especially, be a peace kept in good faith until the Dacotah confederacy is in effect destroyed." For this Mr. Browne received the gratuitous scoffs and sneers of politicians and army officers, who are wont to be "wise before their time;" yet subsequent events have fully justified the truth thereof.

tribal *Shaman*, and with better success than would be imagined by those familiar with Indian character. Female chastity is, or was, the "*medicine*" of the Flatheads. Among the Mandans friendship for whites was long held a source of national and individual advantage. The lobo, or prairie-wolf, is the tutelar of the Blackfeet, one or two tribes of Plain Crees, and a branch of the Pend D'Oreilles, and its presence is encouraged about their camps and tepees, though the real secret of their regard is the incessant dolorous howls of the creature are *prima facie* evidence of security, for at the approach of man, the greatest of all foes, it sneaks silently away.*

Then there are personal *Shamans*, that may be either spiritual, totemic, or both, each individual, family, gens, or caste selecting as a familiar, some animal,—usually of the *carnivoræ*, as a tutelar.† With some races this is an occasion of some ceremony, and accompanied by conjuration and divination;‡ and the creature may not be killed for any ordinary purpose, nor its flesh eaten, or skin trafficked with. Many, again, make the selection untrammelled by any ceremony or rite other than fasting. There are also specific *Shamans*, independent of ruling spirits, for the purpose of recalling game, dispersing clouds, insuring rain, and to appease the manes of the departed, which last include chants, songs,§ and mortuitary offerings, all of which are in some sense individual;‖ and tutelars are oftentimes exchanged and discarded.

Shamanism also embodies a conception of the future state that, owing to its peculiar relations, cannot be passed by without remark. The "Land of Souls" comprehends all that is dear to the savage heart, untrammelled by exactions and vexations of mortality. The "Happy Hunting-Grounds" of poesy and fiction, with their pleasant prairies, crystal rivers, countless droves of horses and herds of fat game, perennial and luxuriant grasses and pleasant groves, where there is neither suffering nor pain, illness nor death, and general exemption from all labor, save as may be entailed in preparing food: all are absolute realities to the primitive man, though wrapped in different guises according to the needs of tribes and races.¶ Many, both among the *Shams* and the laity, believe they have visited, or obtained more or less perfect glimpses of, this delightful land through the medium of visions and dreams, some even claiming to have conversed with the *Supreme Spirit*, who invariably appears in the guise of some familiar animal, usually one of the fur-bearing species. An aged Assinoboine was admitted by all who knew him, both of his own and neighboring tribes, to have been shown the "Land Beyond the River," conducted through it by the Great Spirit in person, and subsequently returned safely to his people. Another, an obscure individual of the Cat-Head tribe of the Dacotahs, was believed to have viewed the opening through which issue the herds of bison when called forth from the centre of the earth by *Wakan-Tanka* to feed his children.** And a Blackfoot claimed to have been transported by the "*Old Man*" to the park where the red men were taught the arts of life before they were relegated to their present abode, and whence they will return again if deserving. The Crees, a branch of the great Algonkin race, are famous for clairvoyance, or "second sight," and the facility with which they commune with the unknown; and one young brave, during a protracted illness accompanied by delirium, believed he had passed "over the river" into the "Land of Shades," and returned again expressly to depict its glories to his people. His account was so graphic as to be almost rhapsodical, and failed not to impress all who heard it with its truth.††

* See Appendix A.

† I once witnessed a meeting between two Indians of different tribes, an Ottowa and Otchipwe, neither of whom had ever seen the other. After shaking hands, they announced themselves *brothers*. Subsequently I discovered the relationship assumed arose from both being members of the same *gens*—"The Beaver"—in their respective tribes.

‡ See page 235 for ordeal of conjurors, which is almost identical with these rites.

§ See Appendix B.

‖ See Appendix C.

¶ Various ideas prevail as to the location of the "Delectable Land." The Lachoux place it above a walled canopy (the sky) encircling the world; the Thlinkets of Alaska, according to W. H. Dall, consider it a park hidden away about the head-waters of the Nasse River; the heaven of the Dacotahs and Chinooks is at the centre of the earth; that of the Dog-Ribs beyond the ice that encircles the Pole; and of the Crees and Otchipwes somewhere towards the tropics.

** It will be observed the Sioux long since anticipated "Prof." Syme's wonderful (!) discovery.

†† The following is a literal translation:

"I was ill, and fell asleep. I awoke on the bank of a deep river, whose waters were flowing swiftly and black from a great mist on the south, to a great mist on the north. Many were there before me, gazing at the flood, or the gloomy shore that lay wrapped in mist upon the farther side. Now and again the clouds would roll away, revealing the mouth of another great river

There is a widely-prevailing belief, by no means confined to the ignorant and vulgar, that the savage is preternaturally wise in the secrets of Nature; that he is inherently endowed with faculties whereby a glance suffices to determine the value of any plant, growth, or mineral within the domain of his nomadism; and that his pathological information rises superior to anatomical or physiological considerations, transcending all that has been wrung from centuries of applied research on the part of civilization. Society is wont ever to turn a deaf ear to science and evidence, when the superstitions, that are in some measure inherent to every member of the human race, are called in question; and charlatanism receives its greatest impulse when found upon theologio-scholastic ground, since the clergy have not yet learned that adherence to primitive therapeutics is virtual abandonment and denial of the claims of Christianity. If such is an inherent gift of divinity, so also psychomancy must needs be the true philosophy of the soul! "Prayer-cure" and "mind-cure," far from being new, were both practised, undoubtedly, at the time when man chased the reindeer on the plains of middle Europe.

Somewhat extended knowledge of and experience in the phases of psychomancy as exhibited by the primitive races of America, permit me to speak definitely regarding their therapeutics. In no essentials do they differ from the practices of other races of low organism and development, whether found in Central and Northern Asia or in the jungles of Africa and Polynesia; and the variations noted are merely the sequels of psychological and tribal peculiarities. Consequently it may positively be asserted that the superstitions and bigotries of civilization pertaining thereto are without foundation in either analogy or fact, since they rest only upon the frail foundation of coincidence.*

The savage recognizes no influences, even in the simplest affairs of life, that are not derived from the supernatural and occult. He knows nothing of the relations existing between cause and effect. Physiological and pathological phenomena, and their sequences, are wholly beyond his mental grasp. Even his language is without an equivalent for remedies as *remedies*, or means of defining remedial results; and therapeutic manifestations are deemed but the conflicts of spirits, and the vanquishment of the weak. To him, disease is not morbid phenomena, but the individual or specific manifestation of some obnoxious demon who, through accident or design, has eluded the watchfulness of the tutelar, and established and fortified itself in the part affected. Under such circumstances, as may be imagined, most absurd ideas prevail, and measures adopted for relief are wholly irrelevant. Were I to repeat the barbarities practised to secure the most simple results, or the brutalities entailed by innocuous arrow-head punctures and superficial wounds, or the filthy and even obscene practices that obtain for the relief of every-day indispositions, they would scarce be credited.† Scarification, hacking of limbs (and

pouring its angry waters into the one at my feet. To the south of this river all was bright, beautiful, and glorious; to the north, dark, gloomy, and forbidding. On the one hand was the happy hunting-grounds; on the other, the abode of evil.

"Time after time my companions sought to cross the swift waters to the happy hunting-grounds. Some arrived safely; others were carried to the north, and disappeared in the mists that shrouded that loathsome country.

"At last I ventured. Alas! the current was too swift. The recollection of my evil deeds overwhelmed me. I was unable to stem the swift waters; I was swept to the north shore of the opposite river.

"I scrambled up the bank. Many moons were passed by me hunting in that dreary land. Success rarely crowned my efforts; I was ever on the verge of starvation; in danger of foes, or wet, or cold,—always miserable.

"At length I came upon a river like the one I had crossed,—with mists, and the mouth of a great stream opposite. Breaking clouds soon revealed happy hunting-grounds on the one side, and a still more gloomy and terrible land upon the other. Many sat upon the bank gazing at the troubled flood; others attempting to cross. Some succeeded. But a few were swept away to the region of desolation. These were very bad people.

"I threw myself into the current. I knew I had done well in this dreary hunting-ground, and it gave me courage. I swam boldly and strong!

"Soon I landed upon the shore. My heart became light. My sorrows disappeared as I climbed the green slope. Before me I saw Indians numerous as grass-leaves; bison on the distant plains plenty as rain-drops in summer; a cloudless sky was above me; a warm, happy, scented breeze blew in my face. I threw myself upon the ground and slept. When I awoke I was here in my lodge on these plains again."

* Few have any conception of the prevalence of coincidences. In reality they are more numerous than facts, as any student in the pathological laboratory well knows, and are one of the chief evidences of occult relations existing between *mind* and *matter*.

† The following from the pen of simple and honest Samuel Hearne ("Hearne's Journey"), though the *half is not told*, is sufficiently illustrative:

"The natives themselves (Dog Ribs) never make use of any medicines. . . . Nature alone works the cure." (P. 338.) "They use no medicine either for internal or external complaints, but perform all cures by means of

even the whole body), with flints and knives; the actual cautery,—hot irons, stones, or ignited touch-wood; and the hot vapor-bath, which has less a hygienic and therapeutic significance than as an act of worship; such are the *simplest* of surgical resorts. Think, for instance, upon the "inherent native skill" (as often quoted) that caused the soft parts of the throat, including fauces and soft palate, to be forcibly wrenched out by a pair of bullet-moulds in the hands of an "Indian doctor," and all to relieve a tickling cough arising from relaxation of the muscular tissues of the pharynx and an elongate uvula!* And this was not provoked by any appreciation of the real difficulty, but was calculated to remove, and render the parts uninhabitable to the demon that had taken up its abode therein. It is perhaps unnecessary to add the operation was in every way a success, for it not only secured the dislodgment of the spirit of the malady, but that of the individual likewise; and the death of the unfortunate was deemed the sequel of extreme malignancy on the part of the former.

The so-called "Indian doctor,' who penetrates our cities and towns, or perambulates the villages and rural districts, preying upon the superstitions of civilization, if really a red man, is never a true *Sham* or "*Medicine-man*," but some knave, who has profited by association with the whites, taking a leaf from the book of the pale-faced charlatan. By assumed stoicism, dignity, imperturbability, and brevity of speech, the reasons for which last are obvious, along with glances replete with concentrated wisdom, he has little difficulty in securing dupes and following. He is nearly always a drunken scoundrel and *ex-protégé* of some missionary society, one who, among his own people, receives the scorn and contempt due a renegade, not one of whom would accept the *dogwood* bitters, *tag-alder* teas, *prickly-ash* stews, *crowberry-bark* decoctions, *sumac* infusions, and *mandrake* physic, which he so lavishly distributes in all their crude nauseousness to his white admirers.

Again, the position and ease attendant upon a reputation for *Shaman* is wont to develop pretenders and charlatans in the lower as well as upper ranks of society; but such are in no sense "*Medicine*-men," nor do they often secure permanent or respectable following. Many a warrior, revered and respected in council and tribal deliberations, has become the butt and jeer of an entire community as a sequel to pretensions to "*medicine*." On the other hand, a well-known poltroon, inferior in intellect perhaps, through innate or acquired faculties (from *epilepsia*, oftentimes) that fit him for the position, obtains admittance to the ranks of the fraternity of *Shams*, thereby becoming an oracle whose behests may not be assailed or controverted, even by chiefs; and his influence extends not only to his own immediate clan, but to neighboring tribes,†

charms. In ordinary cases, sucking the part affected, blowing and singing to it, hawking and spitting, and at the same time uttering a heap of unintelligible jargon, compose the whole cure. For some inward complaints, such as griping in the intestines, difficulty of making water, etc., it is very common to see these jugglers blowing into the *anus* or into the *parts adjacent* till their eyes are almost starting out of their heads; and this operation is performed indifferently on all without regard to age or sex. The accumulation of so large a quantity of wind is at times apt to occasion some extraordinary emotions, which are not so easily suppressed by the sick person; and as there is no vent for it but by the channel through which it was conveyed thither, it sometimes occasions an odd scene between the doctor and patient, which I once wantonly called a *bombardment*, but for which I was exceedingly sorry, as it highly offended several of the Indians, particularly the juggler and the sick person, both of whom were men I much esteemed; and, except in that moment of levity, it had ever been no less my inclination than my interest to show them every respect that my situation would admit. I have often admired the great pains these jugglers take to deceive their credulous countrymen, while at the same time they are indefatigably industrious and persevering in their efforts to relieve them. Being naturally not very delicate, they frequently continue their windy process so long that I have more than once seen the attendant quit his patient with his face and breast in a very disagreeable condition!" (P. 190.)

* A fact.

† Of the influence one such personage may exert, I cite an instance from personal knowledge. A band of Swampies, a branch of the Cree nation, were in the habit, annually with each autumn, of resorting to "Pike's Head," near the mouth of Jack Fish River, on Lake Winnipeg, in order to subsist upon *Ah-tik-a-meg* (white-fish), which could here be had in abundance when other foods were unobtainable. In the midst of one of these migrations (in 1860, I think), they were overtaken by a runner bearing a message from the "Beaver,"—a noted "*Medicine-man*" of the Upper Saskatchewan district,—forbidding nearer approach to the lake, or the taking of fish during that winter, on pain of his displeasure and the evil he would invoke. Though the threat was in no way specific, and merely the sequel to petty enmity and spite, its very ambiguity made it the more alarming. The poor Swampies made haste to break camp and return to their summer hunting-ground, though knowing such would entail the perils of starvation. The result was great suffering and privation: many died from want before their condition became known to the Hudson's Bay Company authorities, and succor was had from this source. (See account of the "Black Snake" in Appendix.)

and perhaps even to the camps of hereditary enemies.

The true *Sham*, or "*Medicine-man*," is little understood by civilization, since he exhibits a phase of savage life that is rarely permitted to come under casual observation. Very far from being a mere knavish varlet, conspicuous for unblushing impudence and petty chicanery as commonly depicted, he is instead a staid, earnest, shrewd, far-seeing man, more than ordinarily endowed, with perceptive faculties sharpened by observation and training, and accustomed to receive impressions and draw conclusions from matters so trivial as to elude general comprehension.* As a rule, he is honest,—as the world goes,—and a firm believer in the truthfulness and advantages of his calling. The deceits he practises are unavoidable, and less with a view to delude humanity, than to cajole and beguile the unseen and unknown. He is a "mind-reader," psychologist, mesmerist, and clairvoyant in one,—of no mean ability; an endowment that, though sometimes inherent, is oftener inculcated and developed through *ecstasia*.†

To the prejudiced vision of critical civilization he may appear an object of contempt and ridicule, owing to incongruities of behavior and costume, yet it must be remembered that frippery is a concomitant of barbaric splendor, pomposity of savage dignity, and asceticism and indifference but synonymes of pride and austerity. The very state of society by which he is surrounded entails all these as necessities, and if he is curt and rude, it is because his position and prosperity is founded upon the superstitions of his calling and following.

The dignity and power that accrue to the profession of psychomancy, by reason of autocratic relations no way limited by tribal considerations, render it the noblest aspiration of the young savage. Even pale-faces have sought to be enrolled within the mystic brotherhood (for such it is) as a means of extending their influence, though few, so far as I am aware, have ever been admitted to the higher and inner mysteries without first being adopted into the tribe and undergoing the prescribed ordeals.‡ Women, as a rule, are excluded, though now and again, by virtue of some extraordinary gift, one sometimes obtains *quasi* recognition. I never knew but one "*medicine squaw*," she of the Salteaux Otchipwes, supposed to have accomplished a quarter more than a century of life,—a claim fully justified by her appearance. Toothless, wrinkled, every way hideous and repulsive, cordially hated and feared, the malignancy of her disposition was such that even when *articulo mortis* she cursed and menaced with a long stick kept by her side for the purpose, the children and dogs that ventured near her *lair*. For many years all but bedridden, she passed her time in solitude and neglect in a rude wigwam on the outskirts of the village, her only covering and garment a filthy caribou-skin robe, her support, merely what she could gather or wring from the tribe by threats. She also boasted numerous acts of cannibalism, by which it was popularly held she had obtained a lease of life that could be terminated only at her own option. Her death was the sequel of a bullet-wound inflicted by a French half-breed she had threatened to

* Herein lies the secret of deductions that, made without apparent basis, are so accurately drawn as to fairly appear marvellous; but the credit thereof is always given to the familiars who, he believes, constantly attend him. Knowledge, however gained, even if through personal study and application, is necessarily a spiritual gift. If it were not, he argues, why do some acquire easily, some not at all? Consequently, whatever his acts or professions, the *Sham* is always consistent.

† The practice of *ecstasia* is universal in all lower stages of culture as the outgrowth of anxiety to peer into the future. It is what procures camp-meeting "*power*" and "*glory*;" that attracts the negro to his houses of worship; sustains the Dacotah under the tortures of the "*Sun Dance*;" and promote the labors of "evangelists;" beside being a derivative of many forms of *mania*, *dementia*, and *hysteria*. To one of its many forms (more particularly *epilepsia*) the religions of the world, past and present, owe their rise,—Judaism, Egyptian and Greek mythology, Lamaism, Buddhism, Christianity, Mohammedanism, and also the sects that have sprung from the Reformation, down to Shakerism. *Theosophy*, which boasts it "will yet sweep the world," far from being advancement, is retrogression, and promises nothing that was not probably known to the earliest nomad, or that is not patent to modern primitive barbarism: it is but primitive psychomancy in a new dress. The savage recognizes that clairvoyant and psychic conditions may be inculcated and developed spontaneously (through various mental and physical processes, by any act or affection that procures anæmic disarrangement or disorganization of the great nerve-centres), hence for this purpose he resorts to fasting, long vigils, and self-inflicted physical tortures. We frequently discover these peculiarities in the midst of civilized society. Two patients of my own exhibited such in marked degree. One, a finely-educated lady, of excellent mental balance and culture, who sought to mitigate the pangs of a great bereavement by excessive devotion to religion; the other, a gentleman of superior brain-development and physique, who was given to occasional deep and prolonged alcoholic and venereal excesses that were invariably followed by psychic and mesmeric phenomena, including voluntary clairvoyance.

‡ See Appendix D.

"bewitch," whereby the latter gained a reputation for bravery that, however, would have stood him in little stead but for the interposition of a prominent *Sham*, who averred the crime would prove a blessing to the tribe; and by order of the latter the body was cremated in the flames of her own dwelling, that her spirit might not secure lodgment in the neighborhood.

Except in special instances, recognition by the brotherhood of *Shams* requires a more or less extended novitiate; but even this favor is not obtained without difficulty, as there is manifest disinclination on the part of the fraternity to increase their number, and thereby divide power and profit. The friends of the aspirant are always ready to promote his interests, even to the sacrifice of personal wealth, since the position is one of honor and emolument, from which they expect to derive due advantage, and consequently heavy bribes are not infrequently tendered, and as often, perhaps, rejected.

Consent obtained, the candidate enters upon his duties by becoming an assistant, or *acolyte*, to one or more of the brotherhood, by whom he is carefully studied to discover his abilities. The apprenticeship is arduous, beset throughout by trials and stumbling-blocks calculated to tax to the utmost the patience, faith, endurance, and fortitude of the individual, and betray his inner consciousness and latent foibles. When sufficiently advanced, he is commanded to proceed, surreptitiously, to some one of the mysterious solitudes accredited with being the haunt of the particular *manit* whose favor is sought, there to offer sacrifice, beside which he must remain constantly, without shelter, unprotected from the elements, fasting,* and alone until the spirit vouchsafes its pleasure by revealing itself personally in its animal form,† or in dream or vision. Here some fail, for the ordeal is no trifling one. If overcome by fears engendered through disordered imagination, or by suffering, hunger, and exposure, or the spirit declines to manifest itself in the accustomed manner, no second essay is ever permitted. Individuals have been known to perish in the midst of these vigils (a most honorable death) rather than face the disgrace that inevitably attends such misfortune; and deception is unknown, since it is believed it must react with fatal effect upon its author. Commonly, however, the desired result is attained with little difficulty, since the situation and surroundings, and the bodily and mental torture induced, serve to disorder the nerve-centres whereby *ecstasia* is procured.‡

Strictly speaking, the novitiate is now ended, and the individual assumes rank as a conjuror, though first he must seek a specimen of the creature of his vision which shall fulfil certain conditions of age, sex, and de-

* W. H. Dall ("Alaska and its Resources," p. 425) says that among the Tlinkets it is permissible for the aspirant to sustain life by means of the roots of *Panax horridum*,—one of the gensing family; but this is not true of the red races generally.

† Certain creatures represent the multiple essences of a very powerful spirit,—such as beaver, bear, marten, mink, weasel, fisher, musquash, otter, wolverine, fox, black- and rattlesnake, sturgeon, dog-fish (*Amia ocellicauda*), lake sheephead (*Haplodonitus grunniens*), etc. The hare also is a powerful representative, and figures prominently in the mythologies of all North American nomads, and likewise appears in the superstitions of Southern and West India negroes, who doubtless derived them from the coasts of Africa. (See *Pah-ah-kuk*, p. 230.)

‡ It has been supposed that narcotics bear a chief part in the production of *ecstasia*, but this is entirely gratuitous. Powell ("Bureau of Ethnology," 1879-80, p. 36) purloins the idea from George Hartwig, and adds, "Civilized man has thus inherited an appetite for narcotics to which the enormous propensity to drunkenness existing in all nations bears witness. When the great actor in his personification of Rip Van Winkle holds his goblet aloft and says, 'Here's to your health and to your family's, and may they live long and prosper,' he connects the act of drinking with a prayer, and unconsciously demonstrates the origin of stimulants. It may be that when the jolly companion has become a loathsome sot, and his mind is ablaze with the fire of drink, and he sees uncouth beasts in horrid presence, that inherited memories haunt him with visions of the beast gods worshipped by his ancestors at the very time when the appetite for stimulants was created."

And *this* is science! In his anxiety to establish a *point*, the author drags the prayer or invocation that attended the libations of ancient civilizations, into the mythology of the primitive man past and present, and establishes it as a sequel to *ecstasia*. Apparently he is not aware that *cerebral hyperæsthesia* is a concomitant of brain *anæmia*, rather *hyperæmia*, and that the latter is usually fatal to *ecstasia;* that *stimulation* is very far from being *narcotism;* and that physiologists will be surprised to learn that *mania a potu* is a "*mind ablaze with the fire of drink!*" While narcotics may procure transitory delirium or mania, neither constitute *ecstasia*, even though ecstatic. No primitive race known to civilization ever resorts to any methods other than fasting, and physical and mental mortification, to secure *ecstasia;* yet many are familiar with both stimulants and narcotics, and employ them for purposes of intoxication. I am not prepared to deny the human family has the love of stimulants as a heritage, however, for the evidence in this respect is fairly overwhelming when we consider that *eight hundred millions* are addicted to tobacco, *half that number* to opium, *five-eighths* as many to tea and alcohol, and *sixty millions* to coffee, and yet the devotees of *coca*, *bang*, *haschish*, *betel*, "*muc-a-more*," and *awa* are not considered. (*Vide Jour. of Inebriety*, for 1877.)

velopment, be killed in a certain way, and its skin dressed in a peculiar manner. Subsequently, when ornamented with savage gauds, it becomes the "*spirit-*" or "*medicine-bag*"* of the conjuror, that thereafter is constantly worn suspended from the neck. Also a portion of the animal's flesh is devoured raw, in order that the spirit thereof may incorporate itself with that of the *Sham*, when it becomes the inspiration of all his acts and intercessor at the courts of the supernatural.

Subsequently progressively higher degrees in psychomancy may be had by those who evince capability therefor, which are instituted at special or stated gatherings of the fraternity, and within a sacred "*medicine*-lodge;" and these mysteries have never been penetrated by any unauthorized person, and are always savagely revolting. Not only are the customary drummings and rattlings to be heard, accompanied by howls and dancing, but also the shrieks and moans of creatures tortured and vivisected for purposes of divination: there is a great similarity between some of these practices and those of howling and dancing dervishes of the Orient. The whole invariably winds up with a feast, to which the laity are admitted, when feats of gormandizing are in vogue that would fairly astonish the digestion of an anaconda. One of the mysteries, more especially obtaining among the Crees, Otchipwes, and Chipewyans, is sometimes practised in public on the eve of the annual "*Goose Feast*," that requires the candidate to devour a whole *live* dog; and a more hideous or fiendish procedure, as viewed by the firelight, attended by the shrieks of the victim and howls of the multitude, cannot be imagined.

* The "medicine-bag" is the repository of amulets by the possession of which the immediate favor of *their* spirits are secured; and these are by no means constant, since they are changed as often as the familiars prove capricious or refractory. No two bags ever exhibit the same array of contents, though certain articles, such as the rattles and fangs of serpents, claws of the beaver, teeth of the bear or raccoon, and bunches of hare's fur, are usually common to all. One recently in my possession contained the following: bit of skin from hough of moose; tip of caribou ear; ditto of lynx,—the hairy tuft; two incisor teeth of some rodent,—probably flying or red squirrel; four beaver teeth; fangs and tail-tip of rattlesnake; two fossil pteropods,—supposed to become moths after twilight; fur from tip of tail of a mink, tied with horse-hair; portion of dried entrails of some fish, species unknown; two ear-bones of the Great Lake sheephead (*Haplodonitus grunniens*),—"*great medicine*," and to which whites attach the superstition of "good luck" insured by their possession; portion of the cartilaginous vertebræ of lake sturgeon; claw of wolverine,—"*very powerful medicine*;" a nugget of native copper; ditto of silver in copper matrix; copper arrow-head,—"mound-builder's;" rounded and polished piece of magnetic iron,—"grape ore;" crooked nail; button with monogram V.R.; claw of cray-fish; vertebræ of lake lizard,—*menobranchus*; bit of feldspar; ditto amethystine quartz; three splinters of seyenite; two packets containing powder, one white, one yellow, carefully wrapped in birch bark and tied with sinew,—one responds to arsenic tests, the other appears to contain sulphate of cinchonidia along with an alkali, neither a savage product; two water-worn splinters of juniper; and lastly, three beautiful *aspasialites* or *chlorophylites*,—"*big medicine*."

APPENDIX.

A.

The great *Shaman* of the Chepewyans is the "Boy in the Moon." The tradition is that an old woman found a boy in the forest, brought him to camp, and cared for him. The lad made for himself a pair of snow-shoes of such preposterous dimensions as to excite the mirth and ridicule of all who saw them; the tallest man in the tribe could not have used them. He could give no account of himself, or where he came from, and altogether he was regarded as mysterious and uncanny, and consequently avoided.

Whenever the tribe suffered for food, and the best hunters could kill no game, some one would be sure to discover a strange track, with steps a prodigious distance apart, that invariably led to a newly-killed deer. There the steps ended, and no further trace of the unknown hunter could be found. Finally suspicion fastened upon the strange boy and his enormous snow-shoes, which corresponded to the track; and when placed under surveillance it was found he was in the habit of stealing secretly from the camp, returning again in some mysterious and incomprehensible manner, leaving no trace, and defying the utmost watchfulness. On such occasions also a newly-killed deer was always discovered.

Though identified as their unknown benefactor, he still was neglected, poor, and ragged. But the following winter, at a time when the hunters had met with great success and killed a number of caribou, he begged for a bit of fat, which was unkindly and arrogantly refused. That night he disappeared, and no vestiges, save his ragged clothing, thrown upon a heap of refuse and offal, could be found.

A moon later he suddenly reappeared, but well dressed and grown to man's stature. He now informed the people his disappearance was caused by his return to his home in the moon, whence he should shortly return, and that he would continue to afford them countenance and protection as long as they were deserving. When in distress, they might appeal to him, when he would be the judge of their needs; but, as punishment for having refused him a piece of fat when he sought it, all deer should thenceforth be lean in winter and fat only in summer, which is true of the caribou to this day. Since then he has continued to reside in the moon, where his face may sometimes be seen; and the hunters are his especial care, and with an offering of fat rarely fail to secure his favor.

B.

The following is the song of a Blackfoot squaw as sung to appease the manes of her son who was killed by the Crows or Upsaraukas:

"Many scalps will be taken for your death:
The Upsaraukas will lose many horses:

Their squaws will weep for their braves:
They will curse the spirit of Isthumaka!
O my son! I will come to you,
And make moccasins for the war-path,
As I did when you struck the lodge
Of the 'horse-guard' with the tomahawk.
Farewell, my son! I will see you
Beyond the 'Broad River.'

"O my son, farewell!
You have gone beyond the 'Great River';
Your spirit is far beyond the Sand Buttes;
I shall not see you for an hundred winters;
But you will scalp the foe in the green prairie
Beyond the 'Great River.'
When the braves of the Blackfeet meet;
When they smoke the spirit pipe and dance the war-dance;
They will ask, 'Where is Isthumaka?
Where is the bravest of the Mannikappi?
He fell on the war-path!'"

Said the gentleman from whom the foregoing was obtained, "Sung in a plaintive minor with wild irregular rhythm, the dirge was far more impressive than mere words can convey."

C.

The majority of whites brought in continuous and intimate relations with savages and nomadic life, notwithstanding education, prior teachings, and iron-clad creeds, are wont to imbibe more or less of the superstitions of *shamanism*, and oftentimes surpass the nomads themselves. This may appear strange at first thought, yet we find the same occurring in the midst of the most advanced civilizations under the guise of Spiritism and Theosophism, "Vitipathism," etc. The "Free Trapper," so graphically described by Washington Irving, though now all but extinct, was wont to ostentatiously out-medicine (so to speak) even the red man. His horse and its caparisoning and ornaments were each and all "medicine," also his apparel from cap to moccasins, and the sash, and the knife, axe, and pipe suspended therein. By means of "*medicine* powder," a "*medicine*-gun" was made to propel "*medicine*-bullets." And from his neck depended a "*medicine*-bag," with *medicine* for almost every imaginable phase of life and existence, including accidents by flood and field, to secure success in trapping, to procure rain or sunshine, etc.

D.

Sometimes a very trifling circumstance will unwittingly, perhaps, elevate a white man to rank as a *Sham*, and if possessed of tact and ability, he may be acknowledged by the red "brethren of the profession." A foolish and petulant remark gave one Meldram, an employé of the American Fur Company at Fort Benton, the favorite *medicine-man* of the Crows, a position he accepted, and held for years to their satisfaction and his own profit, his amulets being a silver watch of the "bull's-eye" pattern and an almanac, which latter, by reason of the cut of a human form partially eviscerated and surrounded by the signs of the zodiac that appeared upon the title-page, was deemed "most powerful *medicine*." During the construction of a heavy press for baling furs he was constantly pestered by curious savages. Finally a number of Crows began making inquiries at a moment when he was busy getting a heavy beam in place, and he curtly replied it was a *medicine* that would cause snow to fall to a depth marked by the knotted cord attached to the lever. The fame of the "snow medicine" rapidly spread. Hundreds came to see it from a distance, and all looked forward to winter with no little anxiety. Strange to say, snow *did* fall to the depth indicated, about a yard, and though it touched the knot of the rope, never rose any higher.

By no less a bit of foolishness I found myself famous. Two of us were staying with an illicit vendor of alcohol in the Indian country, our host being a strong partisan of A. J. Davis and Richard D. Owen. For want of better amusement, we were wont to chaff him upon his belief, and one evening sat down to a small pine table and procured all the phenomena of "spirit-rapping," "table-tapping," etc., somewhat to our own astonishment, for neither had ever essayed the feat before, and greatly to the delight of our landlord, who vowed we had heretofore "been testing" him. The last to leave the table, as I rose that useful article of furniture insisted upon following me some distance across the room. A dozen Otchipwes had witnessed the performance, and now they hurried out of the house, shaking their garments, and exclaiming, "*Spirits! spirits!*" The day following I met one of the dusky audience, who requested a charm to drive away rheumatism, to which I responded by handing him a *cachou aromatique*. An hour later another proffered the same request, seizing my hand, and adding, "*Ah, Do-ŏak-tor, I 'fraid of yoh: yoh great med'z'n,—mak gŏs* (ghosts)!" A few years later I found both had been permanently relieved, and that the pellets, minus their silver coating, were still in existence and accredited with many wonderful cures!

PORT HURON, MICHIGAN.

(To be continued.)

THE ANTIPYRETIC ACTION OF ANTIFEBRIN.

BY DR. E. W. EVANS, EASTON, PENNA.
(From private laboratory of Dr. Ott.)

PART I.—ON THE NORMAL ANIMAL.

THE many favorable reports on the clinical action of the new antipyretic acetanilide, perhaps more familiar under the name of antifebrin, have led me to make a few experiments with it in order to ascertain as far as possible its mode of action, more particularly in temperature reduction.

Acetanilide is not by any means a new substance, having been known to chemists for a long time; but it is only recently that its physiological property as an antipyretic was discovered.

It is a neutral body, not acted upon by hydrochloric or sulphuric acids, and not affected by alkalies, except when greatly concentrated. Occurs as a fine white crystalline odorless powder, imparting a slight burning sensation to the tongue. Dissolves in ether, alcohol, benzene, benzol, and essential oils, but is insoluble in cold and only sparingly soluble in warm water, from which it crystallizes again at 108° F.

Its chemical constitution is $NHC_6H_5C_2H_3O$, and is obtained in an impure state by the

action of aniline upon glacial acetic acid in the presence of heat; and from this the pure article may be secured by crystallization from benzol or boiling water.

Hence the drug belongs chemically to the acetanilides or phenyllacetamides, differing greatly in this respect from the other antipyretics, which belong either to the phenols (carbolic acid, hydrochinon, resorcin, salicylic acid) or to the chinoline order (antipyrin, chinolin, kairin, quinine, thallin).

Considerable difficulty was at first encountered in the administration of the drug in the solution used (1 gramme to 50 c.c. warm water) owing to its high point of crystallization; this, however, was overcome by frequent applications of heat to the solution, together with further dilution, one-half usually being sufficient to maintain the drug in solution at a temperature not too high for injection.

Preliminary to the experiments on heat production and heat dissipation I have made one or two in order to note its general action on the heart and respiration.

Experiment 1.—Rabbit; weight, 2.72 pounds.

Time. P.M.	Temp.	Remarks.
2.25	103.4°	
2.37	.....	Injected .12 gramme antifebrin hypodermically.
2.47	102.4°	
2.54	.....	.06 gramme hypodermically.
3.10	102.2°	
3.20	.....	.06 gramme hypodermically.
3.38	.....	.06 " "
3.45	101.6°	
3.53	.....	Slight drowsiness.
4.06	101.6°	
4.35	.....	.15 gramme injected into jugular.
4.41	.....	Perfectly relaxed; reflexes still manifest.
4.45	97.3°	
4.50	.....	Pulse 188; respiration 64.
5.05	95.8°	Pulse 172; respiration 64; all reflexes abolished.
5.30	.....	Pulse 144; respiration 56; .75 gramme in jugular.
5.35	.....	Pulse 132; respiration 16; gasping and irregular.
5.45	94.4°	Respiration more regular.
6.00	.....	.5 gramme injected into jugular.
6.01	.....	Respiration almost ceased; heart still regular but weak.
6.03	.....	Rabbit dead; heart immediately exposed and found not beating.
6.10	.....	Examination of urine revealed no sugar, but the manifest presence of albumen.

It will be seen that in this experiment 1.7 grammes of antifebrin were exhibited to an animal weighing only 2.72 pounds, within a period of three and one-half hours, before death ensued. It would seem at least that the drug is not a very dangerous one in its effect upon either the heart or respiration, especially since the doses used were extremely large in comparison with those found necessary to obtain the desired effect in its clinical application,—11 grains producing a fall of 2.4° C. in three hours in a man aged nineteen years suffering with typhoid fever. About four times that amount of antipyrin being required to produce an equal reduction.*

In the experiment given above .3 gramme caused a fall of 1.8° F. in one hour and twenty minutes without having any perceptible influence, either general or upon the heart or respiration.

Experiment 2.—Rabbit; weight, 2.5 pounds.

Time. P.M.	Temp.	Remarks.
2.30	100°	The rabbit's temperature was 102° previous to the introduction of the canula into the jugular.
2.35	.....	.12 gramme antifebrin injected.
2.48	99.6°	
3.00	.....	.12 gramme into jugular.
3.05	.....	Partial relaxation; staggering.
3.13	99.8°	
3.45	100.6°	
3.50	.....	.12 gramme injected into jugular.
4.30	101.3°	Rabbit lively as ever and returned to pen.

In the second experiment the same amount of antifebrin that had caused a fall of 1.8° in the previous one produced in the same time a fall of only .4°. The general effect, however (to note which was the object of these experiments), was almost equally unnoticeable.

The results here obtained, at least in the first experiment, are at slight variance with those of Cahn and Hepp, as regards temperature reduction in the normal animal.

Again, in the calorimeter experiments I never failed to get some reduction (from .4° to 1.6°) when small doses were employed.

It is quite possible that this disagreement may be entirely due to a difference in the amount of drug exhibited, since large doses elevate temperature. However that may be, it is evident that the toxic effects of antifebrin are not manifested by such doses as are required to secure the necessary reduction in fever.

I next proceeded to study by a few calorimetrical experiments the effect upon heat production and heat dissipation.

The calorimeter used is known as *D'Arsonval's*. The receiver is formed by the inner one

* "Clinical Experiments of Cahn and Hepp," *Centralblatt für Klinische Medicin*, August 14, 1886.

of two concentrically arranged copper cylinders, the outer one being about one-third greater in diameter, thus creating a second annular chamber between the two, which is filled with water for the purpose of maintaining a uniform level of temperature to the calorimeter. Through the inner chamber the air is drawn over the animal, and pumped out through the large metre of Voit's respiration apparatus by a water-wheel attachment. The D'Arsonval gas-regulator I will not describe, since it never worked satisfactorily and was not used in any of my experiments. The thermometric observations were made on Geissler's thermometers, which were previously carefully tested at the Yale Observatory and the necessary corrections made.

I will exemplify these experiments by rendering the first one in detail, and in the succeeding ones simply make use of the results obtained.

The method of calculation employed in these experiments is practically the same as that of Dr. H. C. Wood.

Experiment 3.—Rabbit; weight, 3.26 pounds.

Time. P.M.	Air temp.	Exit temp.	Cal. temp.	R. temp.	Metre.
1.24	74.35°	68 95°	69.25°	104.4°	868204
1.39	75.05°	71.65°	69.45°	.....	.....
1.54	75.25°	72.01°	69.65°	.....	.....
2.09	75.45°	72.19°	69.85°	.....	.....
2.24	75.45°	72.01°	70.05°	104.6°	869100
	75.11°	71.36°	69.65°	.2° gain.	896
	71.36°		.80° gain.		
			.30° gain corrected.*		
	3.75° loss.				

2.40 .045 gramme antifebrin injected hypodermically.

Time. P.M.	Air temp.	Exit. temp.	Cal. temp.	R. temp.	Metre.
3.06	75 35°	70.93°	70.35°	105.0°	869100
3.21	75.05°	73.45°	70.75°	.....	.....
3.36	74.95°	73.81°	70.95°	.....	.....
3.51	74.75°	73.09°	71.15°	.....	.....
4.06	74.55°	73.09°	71.35°	104.4°	870629
	74.93°	72.87°	70.91°	.6° loss.	1529
	72.87°		1.00° gain.		
			.64° gain corrected.		
	2.06° loss.				

* By making a series of experiments in which there was no animal placed in the chamber of the calorimeter, and no air pumped through, it was observed that the calorimeter temperature in one hour rose .09° for every degree that the air temperature stood above that of the calorimeter; discovering the fact that the calorimeter rise was due to three factors instead of two, viz., heat given to the calorimeter by the animal, heat given off by the air passing through (always at a temperature about 3° higher than that of the calorimeter), together with a relatively large amount of heat taken from the surrounding air. This last factor was always overcome by making this .09 correction on the calorimeter gain previous to the calculation of heat units given to the calorimeter.

Before injection:

$V' = 896$ litres of air pumped through the large metre.
$t' = 71.36° - 32° = 39.36°$, number of degrees the air is heated above 32°.
$V + (V \times 39.36 \times .002035$ coefficient of expansion$) = 896$.

$$V + .0800976\,V = 896$$
$$1.0800976\,V = 896$$
$$V = \frac{896}{1.0800976} = 829.6296$$

$W = V \times .002851$, weight of 1 litre of air at 32° F. = 2.3552 pounds.
$Q = 2.3552 \times 3.75 \times .2374 = 2.0867$, heat units taken from the air.
$Q = W \times t \times$ Sph.
$Q = 37.5 \times 1 \times 1.002 = 37.575$
$Q = W \times t \times$ Sph.
$Q = 43.5 \times 1 \times .095 = 4.1325$

41.7075 Heat units required to raise the calorimeter 1°.
$41.7075 \times .3 = 12.51225$ Heat units given to the calorimeter.
2.08670 Heat units taken from the air.
10.42555 Hourly heat dissipation.
Heat added to reserve .54110 $= (3.26 \times .2 \times .83)$
10.96665 Hourly heat production.

After injection:

$V' = 1529$ litres of air pumped through the large metre.
$t' = 72.87° - 32° = 40.87°$, number of degrees the air is heated above 32°.
$V + (V \times 40.87 \times .002035) = 1529$

$$V + .08317045\,V = 1529$$
$$1.08317045\,V = 1529$$
$$V = \frac{1529}{1.08317} = 1411.819$$

$W = V \times .002851$, weight of one litre of air at 32° F. = 4.025.
$Q = 4.025 \times 2.06 \times .2374 = 1.9684$ Heat units taken from the air.
$41.7075 \times .64 = 26.6928$ Heat units given to the cal.
1.9684 Heat units taken from the air.
24.7244 Hourly heat dissipation.
$(3.26 \times .6 \times .83) = 1.6234$ Heat taken from reserve.
23.1010 Hourly heat production.

Time. P.M.	Rec. temp.	Cal. temp.
1.24	104.4°	69.25°
2.24	104.6°	69.55°
		.30°

2.40 .045 gramme of antifebrin injected hypodermically.

Time. P.M.	Rec. temp.	Cal. temp.
3.06	105.0°	70.35°
4.06	104.4°	70.99°
		.64°

RESULTS.

Hourly heat dissipation	10.42
Hourly heat production	10.96
Hourly heat dissipation	24.72
Hourly heat production	23.10

SUMMARY.

Hourly heat dissipation before antifebrin	10.42
Hourly heat dissipation after antifebrin	24.72
Gain in heat dissipation	14.30
Hourly heat production before antifebrin	10.96
Hourly heat production after antifebrin	23.10
Gain in heat production	12.14

Experiment 4.—Rabbit; weight, 2.28 pounds.

Time. P.M.	Rec. temp.	Cal. temp.
1.40	102.4°	72.65°
2.40	101.0°	73.06°
		.41°

2.41 .015 gramme of antifebrin injected hypodermically.

Time. P.M.	Rec. temp.	Cal. temp.
3.30	101.4°	73.45°
4.30	101.0°	73.76°
		.31°

RESULTS.

Hourly heat dissipation	16.20
Hourly heat production	13.22
Hourly heat dissipation	12.76
Hourly heat production	11.91

SUMMARY.

Hourly heat dissipation before antifebrin	16.20
Hourly heat dissipation after antifebrin	12.76
Loss in heat dissipation	3.44
Hourly heat production before antifebrin	13.22
Hourly heat production after antifebrin	11.91
Loss in heat production	1.31

Experiment 5.—Rabbit; weight, 2.29 pounds.

Time. P.M.	Rec. temp.	Cal. temp.
2.24	103.8°	68.75°
3.24	103.8°	69.05°
		.30°

3.46 .015 gramme antifebrin injected hypodermically.

Time. P.M.	Rec. temp.	Cal. temp.
4.16	104.4°	69.95°
5.16	103.3°	70.31°
		.36°

RESULTS.

Hourly heat dissipation	10.96
Hourly heat production	10.96
Hourly heat dissipation	12.54
Hourly heat production	10.19

SUMMARY.

Hourly heat dissipation before antifebrin	10.96
Hourly heat dissipation after antifebrin	12.54
Gain in heat dissipation	1.58
Hourly heat production before antifebrin	10.96
Hourly heat production after antifebrin	10.19
Loss in heat production	.77

Experiment 6.—Rabbit; weight, 2.74 pounds.

Time. P.M.	Rec. temp.	Cal. temp.
1.27	101°	68.85°
2.27	101°	69.24°
		.39°

2.59 .015 gramme injected hypodermically.

Time. P.M.	Rec. temp.	Cal. temp.
3.37	101.6°	69.35°
4.37	100.0°	69.75°
		.40°

RESULTS.

Hourly heat dissipation	15.58
Hourly heat production	15.58
Hourly heat dissipation	16.68
Hourly heat production	13.04

SUMMARY.

Hourly heat dissipation before antifebrin	15.58
Hourly heat dissipation after antifebrin	16.68
Gain in heat dissipation	1.10
Hourly heat production before antifebrin	15.58
Hourly heat production after antifebrin	13.04
Loss in heat production	2.54

Experiment 7.—Rabbit; weight, 2.52 pounds.

Time. P.M.	Rec. temp.	Cal. temp.
2.13	104.0°	64.59°
3.13	103.6°	64.96°
		.37°

3.25. .0075 gramme antifebrin injected hypodermically.

Time. P.M.	Rec. temp.	Cal. temp.
3.55	103.2°	65.59°
4.55	102.6°	66.14°
		.55°

RESULTS.

Hourly heat dissipation	14.15
Hourly heat production	13.32
Hourly heat dissipation	22.40
Hourly heat production	21.15

SUMMARY.

Hourly heat dissipation before antifebrin	14.15
Hourly heat dissipation after antifebrin	22.40
Gain in heat dissipation	8.25
Hourly heat production before antifebrin	13.32
Hourly heat production after antifebrin	21.15
Gain in heat production	7.83

Experiment 8.—Rabbit; weight, 4.48 pounds.

Time. P.M.	Rec. temp.	Cal. temp.
1.37	102.4°	66.59°
2.37	102.2°	67.14°
		.55°

3.02 .0075 gramme antifebrin injected hypodermically.

Time. P.M.	Rec. temp.	Cal. temp.
3.32	102.8°	67.79°
4.32	102.0°	68.39°
		.60°

RESULTS.

Hourly heat dissipation..... 22.14
Hourly heat production..... 21.39

Hourly heat dissipation..... 24.16
Hourly heat production..... 21.19

SUMMARY.

Hourly heat dissipation before antifebrin..... 22.14
Hourly heat dissipation after antifebrin..... 24.16

Gain in heat dissipation..... 2.02

Hourly heat production before antifebrin..... 21.39
Hourly heat production after antifebrin..... 21.19

Loss in heat production..... .20

Experiment 9.—Rabbit; weight, 2.22 pounds.

Time. P.M.	Rec. temp.	Cal. temp.
1.41	103 4°	67.09°
2.41	102.0°	67.64°
		.55°

3.25 .06 gramme antifebrin injected hypodermically.

Time. P.M.	Rec. temp.	Cal. temp.
4.00	102.0°	68.49°
5.00	102.2°	68.81°
		.32°

RESULTS.

Hourly heat dissipation..... 21.91
Hourly heat production..... 19.34

Hourly heat dissipation..... 11.89
Hourly heat production..... 12.26

SUMMARY.

Hourly heat dissipation before antifebrin..... 21.91
Hourly heat dissipation after antifebrin..... 11.89

Loss in heat dissipation..... 10.02

Hourly heat production before antifebrin 19.34
Hourly heat production after antifebrin..... 12.16

Loss in heat production..... 7.08

Experiment 10. — Rabbit; weight, 2.76 pounds.

Time. P.M.	Rec. temp.	Cal. temp.
3.24	102.0°	68.15°
4.24	102.4°	68.18°
		.03°

4.50 .045 gramme injected into jugular vein.

Time. P.M.	Rec. temp.	Cal. temp.
5.09	102.3°	68.95°
6.09	103.4°	69.17°
		.22°

RESULTS.

Hourly heat dissipation..... .0588
Hourly heat production..... .9751

Hourly heat diss.pation..... 8.0025
Hourly heat production..... 10.5198

SUMMARY.

Hourly heat dissipation before antifebrin..... .0588
Hourly heat dissipation after antifebrin..... 8.0025

Gain in heat dissipation..... 7.9437

Hourly heat production before antifebrin..... .9751
Hourly heat production after antifebrin..... 10.5198

Gain in heat production..... 9.5447

Experiment 11. — Rabbit; weight, 2.76 pounds.

Time. P.M.	Rec. temp.	Cal. temp.
2.33	101.0°	70.15°
3.33	102.2°	70.24°
		.09°

3.58 .015 gramme antifebrin inj. into jugular.

Time. P.M.	Rec. temp.	Cal. temp.
4.20	102.4°	70.45°
5.20	103.6°	70.54°
		.09°

RESULTS.

Hourly heat dissipation..... 1.88
Hourly heat production..... 4.63

Hourly heat dissipation..... 2.37
Hourly heat production..... 5.12

SUMMARY.

Hourly heat dissipation before antifebrin..... 1.88
Hourly heat dissipation after antifebrin..... 2.37

Gain in heat dissipation..... .49

Hourly heat production before antifebrin..... 4.63
Hourly heat production after antifebrin..... 5.12

Gain in heat production..... .49

To better compare the results obtained in the foregoing experiments I have tabulated them as follows:

Table No. 1.—Antifebrin Experiments on Normal Animals.

Experiment.	Duration.	Weight of animal.	Dose.	Hourly heat dissipation.				Hourly heat production.			
				Normal.	After drug.	Decrease.	Increase.	Normal.	After drug.	Decrease.	Increase.
	Hrs.	Pounds.	Grams.								
3	2	3.26	.045	10.42	24 72	.....	14.30	10.96	23.10	.....	12.14
4	2	2.28	.015	16.20	12.76	3.44	.....	13.22	11.91	1.31	.....
5	2	2.29	.015	10.96	12.54	.....	1.58	10.96	10.19	.77	.....
6	2	2.74	.015	15.58	16.68	.....	1.10	15.58	13.04	2.54	.....
7	2	2.52	.0075	14.15	22.40	.....	8.25	13.32	21.15	.....	7.83
8	2	4.48	.0075	22.14	24.16	.....	2.02	21.39	21.19	.20	.....
9	2	2.22	.06	21.91	11.89	10.02	.....	19.34	12.26	7.08	.....
10	2	2.76	.045	.0588	8.0025	.....	7.94	.9751	10.5198	.....	9.5447
11	2	2.76	.015	1.88	2.37	.....	.49	4.63	5.12	.....	.49

To simplify a little further I have arranged

Table No. 2.

	Heat dissipation.	Heat production.
+	14.30 +	12.14 +
	1.58 —	7.83 —
	1.10 —	9.54 +
	8.25 —	.49 +
	2.02 —	.....
	7.94 +	.....
	.49 +	.....
—	3.44 —	1.31 —
	10.02 +	.77 —
	.....	2.54 —
	.....	.20 —
	.....	7.08 +

The plus and minus signs in the first column indicate respectively increase and decrease of heat dissipation and heat production.

The same signs after the heat units expressed indicate (relatively) large and small doses.

Examination of the results as exhibited in Table 2 shows an increase of heat dissipation in seven of the nine experiments and a decrease of heat production in five.

The only deduction that can be made is evident in the table itself, viz., that the antipyretic action of antifebrin is due principally to an increase in heat dissipation aided in more than half the cases by a decrease in the production. Also that, relatively speaking, both large and small doses increase heat dissipation, while as to heat production large doses seem to increase and small doses to diminish it.

Upon examination of the above plate where we have the curves of heat production and heat dissipation so placed as to show their relation to one another, and also to the dose and temperature, it will be observed that an alteration in the normal relation of heat dissipation and heat production occurs in Experiments 5, 6, and 8, where there is an increase of dissipation occurring synchronously with a decrease of heat production instead of a corresponding increase in heat production, since in health increased heat dissipation provokes increased heat production and decreased dissipation decreased production ; while, on the other hand, increased heat production is always attended by increased dissipation, and *vice versa*, thus keeping the bodily temperature uniform.

The following experiments were then made to note the relation existing between the temperature and the pulse after the administration of the drug.

Experiment 12.—Rabbit.

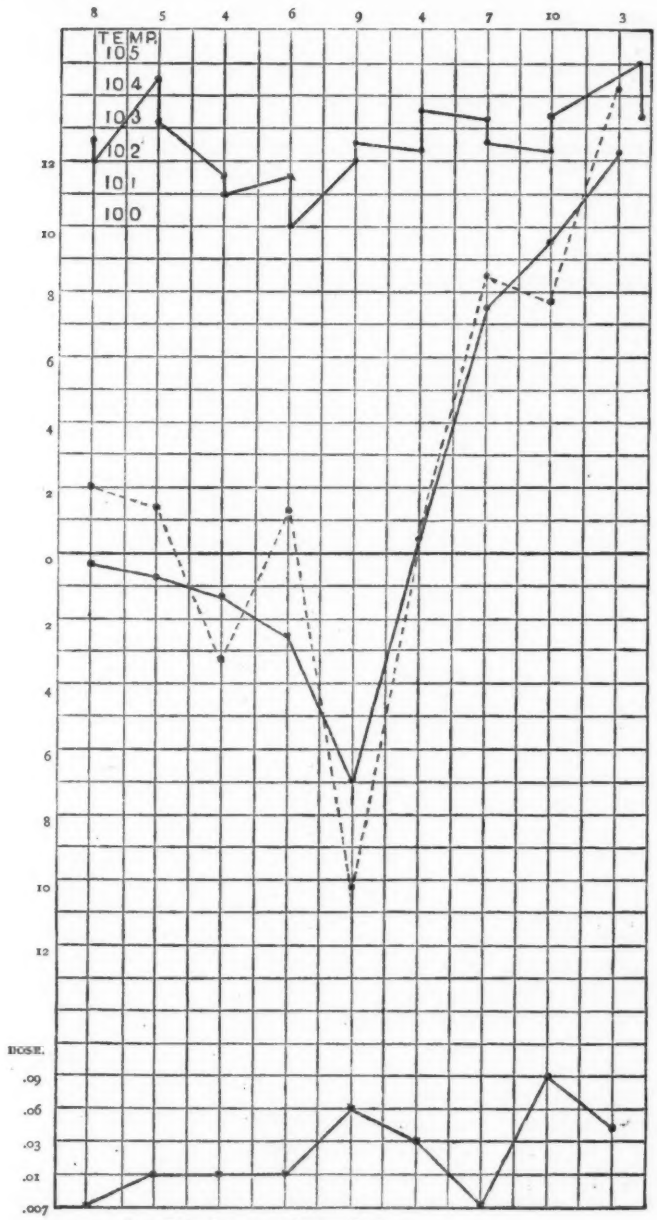
Time. P.M.	Pulse.	Press.	Temp.	Remarks.
2.20	...	.....	100.6°	Canula put in jugular vein.
2.44.45	61	130	.....	Respiration 34.
2.45	68	130	.....	.03 gramme of antifebrin injected into jugular vein.
2.46	67	122	.....	
2.47	66	130	99.6°	
2.48	69	126	.....	
2.49	66	136	.....	
2.50	67	130	.....	Respiration 36.
2.51	68	130	.....	
2.52	66	134	.....	
2.53	67	128	.....	
2.54	67	136	.....	
3.03	...	.....	99.4°	Respiration 44.
3.14	...	.....	99°	Respiration 44.
3.28	...	.....	98.8°	
3.30	60	114	98°	
3.32	...	.....	.....	Rabbit killed.

Experiment 13.—Normal rabbit.

Time. P.M.	Pulse.	Press.	Temp.	Remarks.
2.15	...	...	97.6°	Respiration 80; temperature before being put on the holder was 103.2°, respiration 56.
2.17.15	50	76	.....	
2.17.45	51	76	.....	
2.18	51	76	.....	.015 gramme antifebrin injected into jugular.
2.19	50	76	.....	
2.20	52	88	.....	
2.21	...	90	.....	
2.22.15	52	92	.....	
2.25	...	...	97.6°	Respiration 48.
2 34	...	100	97.6°	
2.35.15	47	114	.....	
2.37	...	.....	97.4°	Respiration 38.
2.40.15	53	104	.....	
2.47	...	.....	96.8°	
2.50	...	.....	.....	Struggling.
2.51	...	.....	.....	Tremors.
2.55	...	.....	.....	Struggling.
3.04	...	106	96.8°	Respiration 34.
3.10	...	.....	.....	Struggling.
3.15	...	.....	96.4°	Respiration 30; rabbit killed.

Experiment 14.—Normal rabbit ; antifebrin.

Time. P.M.	Pulse.	Press.	Temp.	Remarks.
3 52	...	.....	102.6°	Respiration 72.
3.54.30	...	114	.....	
3.54.45	68	118	.....	
3.55	71	114	.....	.0227 gramme antifebrin into jugular vein.
3.56	70	120	.....	



- - - - heat dissipation; —— heat production.

PLATE I.—The dotted line shows heat dissipation and the straight line heat production; the curves above and below the zero line, which is the normal line, mean so many units of increase or decrease of heat production or heat dissipation after the use of the drug.

The dose curve is at the bottom of the plate, while the temperature curve is at the top. Thus, in Experiment 9, the dose is .06 gramme, heat production and heat dissipation are diminished, and the temperature rose from 102.2° to 102.4°.

Time. P.M.	Pulse.	Press.	Temp.	Remarks.
4.05	76	114	102.6°	.075 gramme hypodermically.
4.10	...	.....	101.6°	Respiration 64.
4.12	...	120	.....	.015 gramme injected into femoral vein.
4.30	...	.....	100.6°	Respiration 52.
4.36	...	128	.....	
4.38	69	126	.....	Tremors.
4.54.15	78	120	100.4°	Respiration 56.
5.05	...	118	.....	
5.10	...	120	100.4°	Respiration 44; rabbit killed.

Experiment 15.—Rabbit; antifebrin.

Time. P.M.	Pulse.	Press.	Temp.	Remarks.
2.15	...	.....	103°	Respiration 32.
2.20	...	.....	100.4°	After preparation of the jugular.
2.36	...	.....	100.4°	Respiration 28; tremors.
3.00	...	.....	99.4°	Respiration 36; tremors.
3.00.15	66	118	.....	
3.01	70	114	.....	.015 gramme injected into jugular.
3.01.30	72	114	.....	.015 gramme into jugular.
3.02.30	67	116	.....	
3.03.30	...	120	.....	.03 gramme into jugular.
3.10.45	60	96	99.8°	Respiration 40.
3.23	...	96	99.4°	Respiration 22.
3.35	...	100	.....	
3.41	...	.....	100°	Breathing irregular.
3.48	...	102	.....	
3.51	57	90	.....	
4.00	...	.....	99.4°	Respiration 32; rabbit killed.

The increased heat dissipation observed in a majority of these experiments is evidently not due to a fall of blood-pressure, since the pressure seems to rise instead.

The temperature reduction is also not caused by a fall of blood-pressure, because the facts are to the contrary.

Hence the increased heat dissipation must be due to causes other than circulatory disturbance.

Clinically the drug has been found to increase the pressure and slow the pulse, but this is always in fever, where Müller* asserts the antipyretic effect rarely fails to follow its administration, appearing at the end of the first hour, attaining its maximum at the end of the third, and sometimes persisting for ten hours.

In all my experiments where doses were employed relatively equivalent to those which have given such satisfactory results clinically the temperature invariably fell, the smallest reduction being .4°, while in one case (Experiment 6) it was 1.6°, and this in the normal animal.

Certainly a most favorable indication of its possible action in fever.

The truth or falsity of this will, however, be demonstrated in a future study of its effect upon the fevered animal.

ERGOTINE IN INTERMITTENT FEVER.

Dr. S. L. Savitski, writing in the *Vrach* on the value of ergotine in the treatment of intermittent fever, remarks that the drug has been used with success in the treatment of many affections,—*e.g.*, by Vidal in prolapsus recti, by Hunt and Pepper in diabetes, by Saunders, Murrell, and Noakes in diabetes insipidus, by Allan for the cough in some lung-affections, by Granzio in obstinate constipation, by Gauldmel in the night-sweats of phthisis, by De Martini in spermatorrhœa, by Demange in some forms of typhoid fever, and by Girma in general paralysis. It has been also employed in chorea and in dysentery. The theory of its action in these diseases he does not pretend to expound, but he calls attention to the similarity of the action of quinine and ergotine. Both, he says, undoubtedly cause contraction of the uterus and the spleen, the effect of quinine on the uterus having been scientifically worked out in a dissertation published by T. T. Smolski in 1876, and that of ergotine on the spleen having been shown by Dobodchiki (*Vrach*, 1880) and by Semchenko (*Vrach*, 1883). This similarity led him to think that one of these drugs might serve as a substitute for the other, and he therefore made a large number of observations on the effect of ergotine upon the cases of intermittent fever occurring in the Lubinski regiment with excellent results, especially where an enlarged and tender spleen was present. He finds that a combination of ergotine with quinine acts very satisfactorily, and that in this way considerable quantities of quinine can be saved, as half the dose of quinine which would be required if given alone will suffice if combined with ergotine. The preparation of ergotine used was Bonjean's, the dose in chronic cases being about a grain three times a day.—*Lancet*, February 19, 1887.

* "Antifebrin," *Gaz. Méd. de Strasbourg*, November 1, 1886.

The Therapeutic Gazette

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Leading Articles.

SALOL AS AN ANTIRHEUMATIC AND ANTISEPTIC.

WE have already several times referred to salol as an antiseptic and valuable antirheumatic remedy. As our readers will recollect, this substance is a white powder, without taste, and of an aromatic odor, which may be made by substituting one atom of hydrogen of salicylic acid by the radical phenyl. The substance has recently been subjected to careful study by Drs. Bielschowsky, Rosenberg, and Feilchenfeld, whose papers are published in the second number of *Therapeutische Monatshefte*, a new therapeutic journal, edited by Liebreich. Dr. Bielschowsky reports nineteen cases of acute rheumatism, fourteen of which he designates as especially severe, most of them implicating several joints, and in all of which cure resulted. In eight cases the disease returned, but again was cured by a repetition of the administration of salol, smaller quantities now being required than at first. The disease returned in nearly half the cases cured by this remedy. The number of cases are so small, it is perhaps not to be concluded that a recurrence of rheumatism after treatment with salol is to be dreaded any more than when any other drugs are used. The same author also reports six cases of chronic rheumatism in which the drug appeared to produce no improvement.

Dr. Rosenberg's experience, although he publishes no details, is also favorable to the employment of this remedy. He states that from twenty-four to forty-eight hours only is required in the absolute reduction of fever and pain; the longest time elapsing before relief was obtained occurring in a single case on the fifth day. Dr. Rosenberg also found that in many of his cases recurrence took place in spite of the continuation of small doses of salol. He believes that recurrence of the rheumatic affection more frequently follows the use of salol than with the old treatment by salicylic acid.

Salol should be given in capsules, since it is insoluble in water, although soluble in alcohol. Seventy-five grains may be given in the commencement of a case of acute rheumatism, 15 grains being given every two hours; as soon as fever and pain are relieved the dose may be reduced as low as 30 grains a day, still, however, being given in doses of 15 grains.

It would appear that salol is not entirely free from certain drawbacks, since Dr. Bielschowsky noted four cases in which the action of the heart was slightly disturbed, disappearing, however, on the cessation of the administration of the drug, while in Dr. Rosenberg's experience its administration was powerless to prevent numerous complications of rheumatism, and he refers to several cases in which peri- and endocarditis and pleurisy complicated the affection. Occasionally salol, as is the case in the old salicylic treatment of rheumatism, produces ringing in the ears, sweating, nausea, and vomiting, the sweating being, however, less marked than after the use of salicylates. These unfavorable actions are said to occur in almost all cases, although, of course, in different degrees. Salol when pushed leads to the production of a dark green color in the urine, as in carbolic acid poisoning, which is supposed to be due to the splitting up of salol under the influence of the pancreatic ferments, and its elimination through the urine as salts of salicylic acid and sulpho-phenol. The production of this decomposition in the intestine will explain its value as a powerful disinfectant in intestinal affections, as well as its employment as an external dressing as a substitute for iodoform in the treatment of wounds.

It would appear, therefore, that salol acts as an antirheumatic simply through the salicylic acid which it sets free. It is, however, to be preferred to the latter, being equally efficacious, from the fact that irritation of the gastric mucous membrane is entirely avoided through the use of salol, which is insoluble in gastric juice, and, as mentioned, only breaks up in the small intestine into salicylic acid and phenol. Dr. Feilchenfeld especially calls attention to the use of salol in the treatment of vesical catarrh and pyelitis by its administration internally in doses of 15 to 45 grains. In his experience the employment of salol in all cases of catarrh of the bladder was accompanied by good results, the urine losing its alkalinity and becoming acid, and suppuration being reduced. This favorable action was observed in several cases where other means failed. He also refers to a number of other affections, especially of sluggish ulcers, where its employment was followed by very successful results.

Mr. A. Norman Tate, in a paper read before the Liverpool Chemists' Association on February 3, 1887 (*Pharmaceutical Record*, March 15, 1887), refers to the use of salol as an antiseptic, and believes it in this connection to be very efficacious and much superior to salicylic acid and the salicylates, and he anticipates very satisfactory results after longer trial. As an antiseptic agent it may be mentioned that one use suggested for it is for impregnating bandages or wool for surgical dressings, as it adheres more readily than salicylic acid.

Its preparation has been patented in Germany, England, and other countries, the number of the English patent being 8018, 1886, and it is stated that it may be prepared as follows: 1. Heating salicylic acid and phenol or naphthol with phosphorus pentachloride or phosphorus oxychloride. 2. Melting the sodium or other metallic compounds of the salicylic acid and phenol or naphthol together, with phosphorus pentachloride and phosphorus oxychloride. 3. Treating with phosphorus pentachloride or phosphorus oxychloride the crude product of the reaction obtained in the manufacture of salicylic acid; and, as Mr. Levenstein points out, this last method is probably the most likely to produce the most economical results. The formula of salol, or salicylic phenol ether, or phenol salicylate, is given as

$$HO,C_6H_4CO,O_6H_5.$$

If phenol is replaced by resorcinol, resorcinol salicylic ether may be obtained.

As an antiseptic it may be mentioned that it has neither caustic nor irritating properties, and this is an advantage over some antiseptics now largely employed.

Its special properties have been variously attributed, as, for example, to the phenol it contains, and to the special combination of that substance and salicylic acid, and the liberation of both within the system.

Judging from samples Mr. Tate has examined, he concludes that salol, as supplied commercially, contains about thirty-six per cent. of phenyl.

IS DRUMINE A LOCAL ANÆSTHETIC?

IN a recent issue we referred to an account of some experiments by Dr. John Reid, of South Australia, in which he claimed to have discovered a new local anæsthetic which he termed drumine. As we at that time stated, we did not regard Dr. Reid's experiments as sufficiently accurate to prove the truth of his statements, and unfortunately some recent experiments with the same agent by Prof. Alexander Ogston (*British Medical Journal*, February 26, 1887) appear to confirm our views as to the unreliability of Dr. Reid's statements.

Dr. Ogston received the specimens which he experimented with directly from Dr. Reid. He tested it by injecting 4 minims of a four per cent. solution hypodermically into two persons who were to be operated on, but failed to obtain the slightest anæsthetic results. He also experimented on himself and on a medical student, and found, likewise, that there was no anæsthesia produced, but a tolerably severe pain, which lasted for several days and then disappeared. He then increased the dose to 6 minims, and again found that there was no anæsthesia, but a sharp, aching pain, followed by an area of firm swelling and tenderness over a spot of the size of a crown piece, a result not produced by the alcohol used in the making of the solution when employed alone. The site of the injection remained tender and swollen for weeks.

It was also employed by Mr. Ogston by instillation into the conjunctiva in a number of cases, and produced no anæsthesia, and had no perceptible action upon the pupil or accommodation.

These experiments seem to indicate pretty clearly that drumine as a local anæsthetic has little if any effect, and certainly cannot be compared with cocaine. It is, however, possible

that the specimens with which Mr. Ogden experimented may have undergone decomposition from their voyage from the antipodes. Nevertheless, until the subject has been investigated by a thorough chemist and some one familiar with the methods of pharmacological investigation, we cannot look to find a rival of cocaine in Dr. Reid's Australian anæsthetic.

A SUBSTITUTE FOR MASSAGE.

THE importance of massage in the treatment of various local and constitutional conditions becomes daily more generally recognized. Ten years ago the procedure was scarcely practised in this country, although almost from time immemorial it has been used in Oriental lands. Before the recent changes in the government and laws of Japan its practice was confined by law to the blind, who were thus enabled to make a livelihood in a manner for which they are especially fitted by the peculiar development of the touch-sense which is so apt to follow loss of vision in early life. Provided with a sort of flageolet, the sightless masseur still gropes his way along the streets and lanes of Japan, tooting his instrument to give notice of his presence. In this country we have never known of a blind person practising the art, and we are rather surprised that the managers of blind asylums have never had their attention called to this possible avenue for labor open to their pupils.

Massage acts chiefly by influencing the local circulation in the part which is labored with. The chief objection to it is the skill which is required for its practice and the expense which it therefore entails, and more especially the difficulties of finding employment for its votaries, which forbid its use away from considerable centres of population.

As an aid to or possible substitute for massage, we can strongly recommend the muscle-beaters made by Mr. John G. Ruebsam, of Washington. They consist essentially of india-rubber tubes or balls, so arranged on elastic sticks as to simulate more or less closely the hand as employed in the beating movements of massage. They undoubtedly have the power of distinctly affecting the local circulation in the part beaten with them, and produce no pain or bruising. For the maintenance of nutrition in paralyzed limbs, for the warming of cold feet and other portions of the body which suffer from lack of circulation, as in neurasthenia, for the stimulation of muscles affected with chronic rheumatism, as in chronic lumbagos, we have found them serviceable. When it is possible to obtain skilled massage, and the severity of the symptoms is sufficient to warrant its employment, the muscle-beater may be very well used once a day as an assistant, so to speak, to the skilled attendant. Thus, in the evening it may be employed to aid the massage and manipulation of the morning.

TREE CULTURE.

BETWEEN the years of 1871 and 1878 the Acclimatization Society of Victoria published five contributions from the pen of Baron Ferd. von Mueller concerning such industrial plants as are available for cultivation in extra-tropical countries or in high mountain regions within the tropics. These contributions became the bases of publications in Victoria, in India, in New South Wales, and in Germany, and finally bore fruit in the present volume before us.* This is a work of nearly five hundred pages full of information concerning all kinds of plants, from the mushroom up, which may be suitable for cultivation in the United States. The work, of course, appeals to the agriculturist rather than to the physician, but we have deemed it proper to call the attention of our readers to the book, that such of them as are interested in the material prosperity of the country districts of America may in turn spread the information of its existence among those who may more directly apply its information to practical life. The scientific standing of Baron Ferd. von Mueller gives great authority to everything that he says.

A NEW THERAPEUTIC JOURNAL.

ALTHOUGH the German literature of experimental therapeutics has during the last few decades been worthy of our commendation, hitherto there has not been any German medical periodical of the first class devoted exclusively to the subject of practical and scientific therapeutics. We therefore welcome to our editorial table very warmly

*"Select Extra-Tropical Plants, readily Eligible for Industrial Culture or Naturalization." By Baron Ferd. von Mueller. Detroit, Mich.: George S. Davis, 1884.

the *Therapeutische Monatshefte*, edited by Dr. Oscar Liebrich and published by Julius Springer, of Berlin, the first two numbers of which we have found of great interest both from a scientific and practical view. The periodical is a monthly one, each number containing about eighty pages.

Reports on Therapeutic Progress.

SUTURE OF THE MEDIAN NERVE TEN WEEKS AFTER DIVISION, WITH RECOVERY OF FUNCTION.

At a recent meeting of the Royal Medical and Chirurgical Society Mr. J. Bland Sutton read a paper containing the details of the case of a porter, who, through the bursting of a soda-water bottle, sustained a deep wound of the wrist. The median nerve had been completely divided, and the parts supplied by it were deprived of motion and sensation below the point of section. Ten weeks after the accident the ends were found by dissection, the cut ends vivified and united by suture. Sensation began to return in five days. The most important feature in the case was the ease with which the ends of the severed nerve were found by following the rules which had been gained by studying the effects of neurotomy in horses. A list of previous cases of secondary nerve-suture accompanied the paper.

Mr. Howard Marsh said he felt much obliged to the author of the paper, for the subject was an important one, and the operation comparatively recent. He had seen several cases, and estimated the results as uncertain.

Mr. Holmes remarked that Mr. Sutton seemed to set much value on the knowledge he had gained from neurotomy in horses, where he had observed a cord running from one end of the divided nerve to the other, and serving as a guide in the search for the other end so soon as one is found. He could not think that any such guide was to be found in most cases in the human subject, especially when there had been any laceration about the division of the nerve, or any suppuration round it. He regarded the operation as common, the benefit as uncertain, but he should certainly recommend it if the nerve-ends could be found; in fact, in such a case he should think the operation urgent. In his own practice he had had a remarkable case, where the nerve had been divided six or seven months; the ends were then sewed together, and though there was no improvement in function for the next three or four months after union, there was ultimately complete recovery. His colleague, Mr. Pick, had had a case in a boy, in which after nerve-suture there was no immediate improvement, and the boy was sent away from the hospital as a case of complete failure. After the long suspension of recovery which had been noticed in the other case it was thought worth while to make further inquiries after the boy, and these showed that he also had recovered completely after a long interval. The best prospects for the operation were that the injury should have been both simple and recent.—*British Medical Journal*, January 15, 1887.

A NEW REMEDY FOR ITCHING PILES.

℞ Tinct. capsicum, 1 part;
Spts. turpentine, 2 parts;
Spts. camphor, 3 parts;
Decolorized iodine, 3 parts. M.

—*Chicago Med. Times*, February, 1887.

SALOL IN ARTICULAR RHEUMATISM.

An address on salol and its employment in articular rheumatism and other acute febrile diseases was delivered before the Berlin Medical Society on January 10 by Dr. Herrlich (*Medical Press*, February 9, 1887). He first referred to the investigations made by Nencki and Sahli into its composition and therapeutical effects. According to these observers it is a salicylate of phenic ether, resembling fat in its behavior in the system in being decomposed by the pancreatic ferments into free acid and alcohol,—salicylic acid and phenol. Salol is a colorless crystalline body, with a weak aromatic odor, is almost tasteless, and practically insoluble in water. It never produces nausea, like salicylate of sodium, and is more readily taken. Sahli treated nearly all the cases of articular rheumatism in the poliklinik with it in daily doses of 6 to 8 grammes in individual doses of 2 grammes (30 grs.) each. It was always well borne in these doses. A strong salicylic acid reaction was found in the urine two hours after the first dose. There was no fear of carbolic urine appearing after the doses given. The drug contained forty per cent. of phenol and sixty per cent. of salicylic acid. There was no doubt that the antipyretic action was due mainly to the phenol. Singing in the ears was not always avoided, nor were endocarditic complications.

In addition to the good effects in acute and subacute articular rheumatism, a prompt action was observed in several cases of neuralgia in which salicin had proved inert, and also in *erythema nodosum* and *multiforme*, urticaria, and peliosis. In phthisis, Sahli recommends it in doses of only 0.5 gramme (7½ grs.). It is useful in all cases of diabetes.

Further indications for its employment, on account of the local antiseptic action of both its constituents as set free in the duodenum, were noticed. It is highly probable that it acts antiseptically in the intestinal canal, and it will therefore probably prove useful in intestinal catarrh, typhoid, and cholera.

Syphilitic and other ulcers were rapidly healed by being painted several times a day with salol in powder. It was also found useful in ozæna and otorrhœa, and a three per cent. solution formed an agreeable antiseptic mouth-wash.

Herrlich had used it in twenty-five cases of acute articular rheumatism, in a series of cases of chronic rheumatism, and in some cases of muscular rheumatism, lumbago, etc. It showed itself of decided benefit in the acute form. He could not say what part the carbolic acid played. In any case, the action was so rapid and striking that six grammes of salicylic acid did not correspond to it, so that it might be assumed that the carbolic acid played a part in the rapid improvement. Relapses and endocarditic complications were uninfluenced by it.

PHOSPHATIC DIABETES.

At a meeting of the Medical Society of London, held January 10, 1887, Dr. Ralfe brought forward a case of phosphatic diabetes, and read the particulars of twelve others (*British Medical Journal*, January 15, 1887). These he arranged in groups, in which excessive elimination of phosphoric acid occurred in connection (1) with derangement of the nervous system; (2) in relation to pulmonary disease; (3) as alternating with diabetes mellitus; (4) as running a distinct course like saccharine diabetes, only without sugar. The cases occurred mostly in young male adults, the chief features being great and progressive emaciation, thirst, increased appetite, a tendency to boils, cataract, a dense urine, with or without increase of the other urinary constituents, but always an exaggerated excretion of phosphoric acid. The causes that led to this increased elimination of phosphoric acid were not definitely determined; probably two factors were concerned, namely, inability of the tissues to utilize the phosphorus brought to them, and also an excessive formation of acid in the tissues dissolving out the earthy salts. The prognosis in cases associated with derangement of the nervous system or with pulmonary disease was very gloomy; on the other hand, it was a favorable sign when in diabetes mellitus the sugar was replaced by phosphoric acid. Out of three cases related, two had completely recovered, whilst the third was running a very mild course. With regard to the term phosphatic diabetes, it was evident that the increased elimination of phosphoric acid was symptomatic and not a disease *per se;* it would be improper, therefore, to use the term in that sense, but it would be useful as a distinctive appellation to distinguish between phosphaturia, caused by deposition from alkaline urine, but without excess, and the enormous discharge of phosphoric acid, met with in urines, but not necessarily deposited from them.

VASELINE IN THE HYPODERMIC INJECTION OF ANTISEPTICS.

Meunier, of Lyons, considers vaseline as diffusing itself very rapidly through all the tissues of the body; its diffusibility varies inversely with its consistence, which may be that of a perfect liquid or that of wax; it preserves its diffusibility when holding in solution a microbicide. Antiseptics dissolved in vaseline, when injected beneath the skin or applied upon a wound or a mucous surface, are diffused without exciting pain or reaction, provided that the substances used be pure and in doses which can be tolerated; the dose and consistence of the dissolvant must be varied according to the organ treated.

The method of treatment is as follows:

Among the antiseptics used in these experiments upon animals were carbon bisulphide, carbolic acid, camphor, creasote, salol, chloride of camphor, iodoform, thymol, essence of cubebs, oil of santal, copaiba, oil of cinnamon, turpentine, thyme, eucalyptus, mint, kousso, and most of the vegetable alkaloids. After these solutions had been tried successfully upon animals, they were employed upon men. These are the formulæ:

> Eucalyptol (pure), 5 parts;
> Chemically pure vaseline, 20 parts by weight.

The injections are made upon the outer side of the thigh. The dose tolerated varied

from 15 minims to 3¾ drachms and more, daily.

Eucalyptol (pure), ♏lxxv;
Iodoform, ♏iv;
Vaseline (pure), ʒv.

The dose tolerated is the same as for the first mixture.

Carbon bisulphide, ♏xv;
Vaseline (pure), ʒiv¼.

Of this mixture, 15 to 30 minims, and more, can be given daily, provided small doses are used.

Turpentine, pure (prepared after the method of Berthelot), ♏lxxv;
Vaseline (pure), ʒv.

From ♏xv to ʒiiss may be given daily.

It is of the utmost importance that these substances should be chemically pure, and that they be given with the greatest accuracy in measuring the doses.

All impure vaselines turn black in contact with sulphuric acid. Most samples of commercial vaseline give the following reaction:

When saturated with the purest carbolic acid and slowly heated, it becomes rose-colored, but deposits a violet precipitate. The intensity of the violet color of the precipitate increases on the addition of alcohol; and the color, which is probably aniline in its nature, indicates the presence of nitrogenous impurities which are dangerous; the abundance of the precipitate is in proportion to the amount of impurity present.

In every test made pure vaseline did not give these reactions, and also gave no pain or reaction when injected into animals.

Among antiseptics the essences are nearly all impure. For example, commercial essence of eucalyptus has a strong odor, an acrid taste, an acid reaction, and boils at 80°; its active principle, eucalyptol, which boils at 175° (Cloëz), forms only a third or a half of the commercial article. The same is true of turpentine and its essential element, and of other substances mentioned. Almost all essences contain resins which should not be introduced into the economy. When these articles are mixed with pure vaseline these resins are precipitated, and may be separated by filtration. Pure eucalyptol is not precipitated by vaseline. To prepare for injection, these antiseptics should be thoroughly shaken with the pure vaseline, allowed to stand, and filtered through two Berzélius filter-papers.

Experiments upon animals with these solutions were made in the treatment of the following diseases: fistulous, fungous, tuberculous, and cystic tracts; favus, herpes tonsurans, alopecia, psoriasis, eczema, acne, and venereal lesions; albugo, granular eyelids, glaucoma; puerperal fever.

Animals were also treated for anthrax, scab, farcy, and tuberculosis, general and local.

In all the trials made albuminuria was never produced, even when a temperature of 104° F. was reached and large doses were given. Among many interesting and important observations made was the injection into the lung of a horse of ʒv of a solution of eucalyptol, ʒv of a solution of bisulphide of carbon, without unfavorable reaction; 10 drops of eucalyptol solution were injected into the eye and windpipe of a rabbit; 15 drops into the eye of a sheep; ʒiss under the skin of a horse. Pure vaseline was injected in the following heroic doses under the skin of a horse weighing eight hundred pounds:

First injection, ʒviss.

Second injection, ʒxiv four hours after the first.

Third injection, ʒix ten hours after the second.

In all, one kilogramme (about two and one-fifth pounds) in twenty-four hours.

The whole was well borne by the animal; more could have been tolerated; the best point of injection was at the animal's side; diffusion was instantaneous when the point of injection was rubbed with the hand.

Regarding the use of impure vaseline, a case is cited in which the injection of ♏xv of impure vaseline, injected into the arm, resulted in phlegmon and the formation of a pint of pus. These solutions are also appropriate for the making of antiseptic dressings, and the surgeon can thus make for each case the appropriate dressing, as the circumstances of the case indicate.—*Bulletin Général de Thérapeutique*, January 15, 1887.

DECOMPOSITION OF ANTIFEBRIN IN THE BODY.

WENDRINER, in the *Centralblatt für Medicinischen Wissenschaften*, No. 8, 1887, describes the following tests for antifebrin: If a small quantity of antifebrin be added to normal urine, and the fluid be made strongly alkaline with caustic soda and distilled, aniline is found in the distillate. The urine of patients who have taken antifebrin, however, gives no such reaction for aniline, but antifebrin is decomposed in the organism. Such urine, when

distilled with an acid, gives a considerable amount of phenol, whereas in urine of those who are not taking antifebrin but a faint trace is present. The quantity of the phenol eliminated is about five and one-half per cent. of the antifebrin taken.

THE TREATMENT OF MALARIAL DISEASES BY PICRATE OF AMMONIUM.

Picrate of ammonium possesses valuable therapeutical properties, though it does not seem to have received the attention it deserves. Its properties and uses were first investigated by Dr. Dujardin-Beaumetz in 1872, but it now appears to have passed out of mind. In the *Lancet* for February 19, 1887, MR. H. MARTYN CLARK, of the Amritsar Medical Mission in India, states that his attention was attracted to it accidentally in the following way. He had a patient under his care who had suffered for several months from severe intermittent fever of the quotidian type. Quinine, arsenic, and other antiperiodics had been used freely, but without relief, and after ten days' treatment the fever still recurred daily with its accustomed severity. At this time the local chemist told him of a remedy for fever which he had received some years previous, but had never employed it. This Mr. Clark found to be the picrate of ammonium, and he gave it to his patient with very gratifying results. The fever did not recur the next day nor at any time during the three subsequent months in which the patient remained under observation. Mr. Clark states that he has since then used the picrate of ammonium in the treatment of malarial diseases during a period of four and a half years. He claims that he has treated over ten thousand cases with this agent with the happiest results. So uniformly successful has it been that he has practically given up the use of quinine and cinchona alkaloids in the treatment of intermittent fever, and he has substituted picrate of ammonium for them. The record was kept of five thousand cases of this fever treated with this agent. Of this number, in nine cases only did it fail to cure, and in these quinine succeeded at once.

He usually gives it in doses of from ⅛ grain to 1½ grains four times a day in pill; ½ grain is a fair average dose. Thus given the result is soon visible. In the cases treated, ½-grain doses in the interval prevented the recurrence of the next attack of the fever, while in about twenty per cent. of the patients two or three attacks followed before the fever ceased. In one case of quartan ague, despite large doses of the salt, the fever recurred for six periods, gradually diminishing in intensity, and then yielded to it. It is equally successful in all the forms of ague, but it is a curious fact that the cases in which it failed to cure were all of the tertian variety. He has also employed this agent in the treatment of twenty-five cases of malarial neuralgia of various nerves, six cases of malarial headache, and one of malarial colic. In all these instances it cured completely and speedily. In remittent fever it does not appear to be of use; six cases of a severe type were treated with it without any effect. Neither is the enlarged spleen of ague benefited by it. Mr. Clark has given it in numbers of such cases in conjunction with ergotine with good results, but such results are secured equally by the use of the ergotine alone.

The writer's experience leads to the conclusion that in all varieties of intermittent fever, and in malarial neuralgias, picrate of ammonia is a valuable antiperiodic, and it is an efficient and perfect substitute for quinine. It has the following advantages over quinine: 1. It is much less expensive. This is an important consideration where, as in Indian practice, hundreds of cases of malarial diseases have to be treated annually. 2. The dose given is very much smaller. 3. It does not produce the unpleasant effects that quinine does,—headache, deafness, tinnitus, etc.,—nor does it disorder the digestion or cause nausea, as quinine is apt to do, in the doses in which it has to be given in India.

THE TREATMENT OF HÆMOPTYSIS BY ATROPINE.

HAUSMANN, of Meran, in discussing the above subject, cites the dictum of Traube, that the successful treatment of hæmoptysis consists in the formation of a thrombus in the vessel chiefly concerned, a result best accomplished by lessening the force of the blood stream and also the lumen of the vessel. Although in capillary hemorrhage it is impossible to make smaller the aperture from which blood is escaping, we can endeavor to lessen the calibre of the arterioles, and thus diminish the force of the current of blood in the capillaries. This lessening of blood-pressure may be aided by restricted diet, ice, absolute quiet, digitalis, and agents acting upon the vasomotor nerves by an astringent or reflex action. Traube mentions as a list of hæmostatic agents digitalis, acetate of lead, alum,

tannic acid, the astringent preparations of iron, and several mixtures, as Chopart's. The first agents of this list Traube would use in inflammatory conditions; the second portion would be used against severe hemorrhage. He advises that if no effect is produced by one agent it be promptly replaced by another; and advises morphine injections for pain or mental disturbance.

Ergotin and oil of turpentine have been added to the number of drugs used, but unimportant hemorrhages have been best treated by dietetic means and by rest. Sée employs preparations of turpentine, terpine, ergot, and, as a last resort, morphine subcutaneously and alcohol. The writer has given wine with good results in bleeding from passive venous congestion, and recommended exercise and deep breathing as remedial agents; while in active bleeding rest, ice, and morphine have been found of great value. It is often the case, however, that all remedies are unavailing, and daily hemorrhages persist.

Too energetic treatment is naturally not indicated. Patients often bear medicines badly, and the physician is forced to have recourse to the oldest modes of treatment,—binding the lower extremities; the application to the genitalia or inner surface of the thigh of cold compresses in rapid succession; cold compresses also applied to the chest and over the shoulders, which resulted in some instances in pressure upon the subclavian vein. All of these means, however, often proved useless.

In doubtful cases the writer has seen remarkably good results follow the use of subcutaneous injections of atropine, of which it is possible here to give but a few examples. In one case, which presented cavities in both apices, and had two dangerous hemorrhages daily for six days without a check, three physicians were present at the thirteenth hemorrhage, which was promptly checked by the subcutaneous use of sulphate of atropine in dose of $\frac{1}{200}$ of a grain. The same patient had hemorrhages two months after the first, which were checked by atropine only.

In the case of another patient who, during the winter of 1884, in spite of the best of care at San Remo, had suffered for months from pulmonary hemorrhage, which had ceased in summer, only to recur on the winter following for a long time, two hypodermic injections of atropine sulphate, in doses of $\frac{1}{200}$ of a grain, cured the hæmoptysis completely.

At the close of October the writer saw a pulmonary hemorrhage of severity in the case of a lady who had been treated for eight days with injections of ergotin and with turpentine, etc., quickly checked by subcutaneous injections of atropine in doses ranging from $\frac{1}{200}$ to $\frac{1}{125}$ of a grain, once or more often repeated. —*Therapeutische Monatshefte*, January, 1887.

PEPSIN IN THE TREATMENT OF CHRONIC TROPICAL DIARRHŒA.

In the *Indian Medical Gazette* for December, 1886, Mr. George Harrison Young reports three cases of chronic diarrhœa which had proved rebellious to the ordinary methods of treatment. In each of these cases the treatment was stopped, and the patient placed on a milk diet, a half-pint being taken every three hours, and 5 grains of pepsin given four times daily. The record of his cases appears to show that great benefit was derived from the use of pepsin. Mr. Young states that he has now used pepsin in a considerable number of cases, and always with success. He claims that this mode of treatment is especially applicable to that form of diarrhœa in which the motions are large and frothy. These cases are due to insufficient digestion and secondary fermentation of the food. When this form of disease becomes established astringents are useless and even often injurious. Pepsin at once checks the diarrhœa. Only milk diet should be allowed, and the pepsin may be given with the milk. In typhoid fever, the author claims that pepsin, by increasing digestion and assimilation of food, will thereby lessen the diarrhœa and intestinal irritation, and by so doing will diminish the severity of the disease. It is also useful in dysentery occurring in debilitated subjects.

CATHETERISM OF THE AIR-PASSAGES.

The introduction of a catheter into the larger air-passages, for the purpose of local medication or mechanical dilatation, or to obviate recourse to tracheotomy, has been much facilitated since the introduction of cocaine into laryngeal surgery. A paper recently read before the Medical Society of the Charité Hospital at Berlin by Dr. Landgraf, clinical assistant (*Berl. Klin. Woch.*, 1887, No. 5), illustrates the ease with which the procedure is effected. He described a case presenting symptoms of stenosis of the left bronchus; the symptoms, which had gradually increased in severity, dating over two years. When admitted into the hospital last July, the patient was liable to dyspnœal

attacks; and physical examination led to the above diagnosis. The constriction was at first thought to be due to compression, a view which was borne out by the presence of a small area of dulness over the manubrium sterni and to its right. There was no evidence that this was due to a tumor arising in the bronchial glands. The long duration of symptoms negatived the existence of a malignant tumor, and the absence of bacilli in the sputum set aside the notion of tubercular disease. Aortic aneurism was more probable; but this diagnosis lacked confirmation, the only positive sign being the area of dulness. It was, therefore, thought to lie between syphilitic stricture (the patient had contracted syphilis twelve years previously) and aneurism; and, since the former gave a more hopeful prognosis, the patient was placed under anti-syphilitic treatment. But the dyspnœal attacks increased in frequency, and measurement of the chest showed a diminishing capacity of the lungs. Further, an examination made at the beginning of October revealed what was thought to be a membrane deep down in the trachea. This appearance supporting the endo-bronchial character of the stenosis, it was resolved to resort to catheterism. The larynx was anæsthetized by a twenty per cent. solution of cocaine, and a ten per cent. solution was injected into the trachea. The catheter was easily passed to a distance of 28.5 centimetres from the teeth (found subsequently to correspond to the tracheal bifurcation) without meeting any constriction. The catheterism was repeated at intervals, and on several occasions to a depth of thirty-five centimetres, with a view to traverse the left bronchus. The measure produced so much relief that at the end of the month the patient was well enough to leave the hospital. Unfortunately, the diagnosis of stricture, which had been apparently confirmed by the relief of the symptoms, proved incorrect; for in a few weeks he returned, having had a severe asphyxial seizure, and shortly after died. The cause of the stenosis proved to be—what is by far the most common cause of such a condition—an aneurism of the aorta, which compressed the left bronchus. The condition, which was mistaken during life for a membrane, was an anæmic part of the right wall of the trachea. Although during life some irregularities in the mobility of the vocal cords were observed,—on one occasion the right cord moving less on respiration and phonation, and on another the left cord appearing immobile in the middle line,—yet the dyspnœal attacks could not be referred to involvement of the vagus. They must have been due to the compression of the bronchus, for they disappeared directly the narrowing produced by that compression was mechanically relieved. Dr. Landgraf fully recognized the danger of resorting to such mechanical dilatation in aneurismal cases, and he would hesitate to catheterize in any case in which aneurism could be suspected. Nor is it quite easy to account for the great relief temporarily afforded by the measure in this case. The valuable point learned from it is the ease with which the air-passages can be catheterized with the aid of cocaine, thus affording means to relieve strictures, as well as to apply remedies locally to ulcerated surfaces on the respiratory tract.—*Lancet*, February 19, 1887.

HYPNONE.

Von Schüder writes of fourteen patients treated by acetophenon, or hypnone, in whom favorable results followed. A dose of from 2 to 4 drops was sufficient to produce sleep of several hours' duration; the effect was especially happy among the phthisical.

No ill after-effects were observed. In one case only, after 6 drops had been given, the patient awoke from a long sleep with headache and slight vomiting. The effect, dependent upon the dose and the individual peculiarities of each patient, was manifested after from one-half to one and one-half hours. —*Der Pharmaceut.*, February 1, 1887.

THE DURATION OF THE SYPHILOGENIC CAPACITY IN RELATION TO MARRIAGE.

At a meeting of the Medical Society of the County of New York held on February 28, 1887, Dr. P. A. Morrow read a paper with the above title, which is especially of interest as showing the most recent beliefs as to the probability of the transmission of syphilis after apparent cure (*Medical Record*, March 5, 1887). Dr. Morrow claimed that the fundamental characteristics of syphilis were two: first, prolonged virulence, and, second, susceptibility to hereditary transmission. What is the duration of the contagious stage of syphilis? A century ago the majority of syphilographers would have answered that it began and ended with the chancre. At the present day it is impossible to fix a definite limit when the syphilitic organism is cleansed

from the contagious element. The author of the paper then directed attention to the results of experimentation, and also to clinical evidence, which he regarded as conclusive that in the late tertiary stage the disease is still contagious. Especial attention was also directed to a paper published by Dr. F. N. Otis, in which the writer had taken a position that was opposed by an overwhelming mass of clinical testimony,—that is, that after the termination of the second year it was impossible for a man, all manifestations of syphilis having disappeared, to communicate syphilis. Dr. Morrow believed that the doctrine of the paternal transmission of syphilis was supported by most authorities on general medicine, and also by most syphilographers.

He concluded that there was nothing constant in contagion, and nothing certain in heredity; that the modern division of syphilis into secondary and tertiary periods did not furnish a safe criterion concerning the contagious or the non-contagious character of the lesions; that the chronological completion of the secondary stage did not mark the definite disappearance of the virulent principle; that in the immense majority of cases the contagious activity of syphilis, and its susceptibility of hereditary transmission, ceased after three or four years, but there were well-authenticated cases in which it manifested itself as far removed as five or six years, and even later; that the precise date, in the evolution of the diathesis, when the limit of its contagious or transmissive power had been reached, did not admit of mathematical expression; that this limit was materially influenced by the type of the syphilis, the character of the treatment, the presence or absence of certain conditions, etc., and that to fix the date at which a syphilitic man could marry with safety at three or four years, with or without treatment, and irrespective of the existence of specific lesions, was unwarranted by science or the teachings of experience.

The discussion was opened by Dr. F. N. Otis, who maintained that all the processes of syphilis were processes of growth, characterized by cell-proliferation non-inflammatory in character, and that when the contagious element had been removed the disease was at an end; that beyond the secondary period of syphilis, however long that may be proved to be present, there was no contagion; that all the lesions of the tertiary period of syphilis were free from the contagious element, and were simply sequelæ of the disease; that the period at the end of which marriage could take place with safety had, after thorough treatment, been fixed by the profession throughout the world as three or four years; that there should be, after thorough and prolonged treatment, an interval of a year or eighteen months, during which, without treatment, no syphilitic manifestation had appeared. These were statements in which all believed. For himself, he believed that the person was beyond the contagious stage of the disease at the end of three years, if proper treatment had been carried out. He claimed that, in view of the enormous mass of evidence presented, and of the general experience of authorities, wherever syphilis had been communicated at a period later than three or four years, it would be shown, in such cases, that the true source of the disease was in a lesion less than three years old.

TESTS FOR KAIRIN AND ANTIPYRIN.

Kohn gives, in the *Chemische Zeitung*, the following tests:

For kairin. A drop of solution of ferric chloride gives with a dilute watery solution of kairin a violet color, which changes suddenly to brown. An excess of ferric chloride gives a dark brown, and a concentrated solution a brownish-black precipitate.

Potassium bichromate gives with a neutral solution of kairin at first a dark color, from which a violet coloring-matter very soon forms, which gives with alcohol a mauve-colored solution.

Antipyrin gives with ferric chloride a red color, which is formed with very dilute solutions. Solutions of antipyrin give with nitric acid a clear, greenish-blue color; concentrated solutions deposit greenish crystals. This test reacts in dilutions of 1 in 10,000.

THE ACTION OF ACONITE UPON BODILY TEMPERATURE.

Drs. Lauder Brunton and J. Theodore Cash have, in a research upon the action of aconite upon bodily temperature ("St. Bartholomew Hospital Reports," vol. xxii.), reached the following conclusions:

1. That in pigeons aconite acts as an antipyretic, both in large and small doses.

2. This antipyretic action is exerted whether their body temperature be normal, or be artificially raised, or artificially reduced, at the time of the injection of the drug. In all

cases the injection causes the temperature to fall.

3. This fall is usually less in birds which have been artificially cooled than in birds whose temperature is normal, or has been raised artificially.

4. The action of the drug is apt to be modified by individual peculiarities in the birds which we are at present unable to explain.

5. The temperature returns more rapidly and completely towards the normal when the birds which have got aconite are kept in a warm place, although the primary fall induced by the administration of the drug may have been as great as, or greater than, that observed at medium temperatures.

6. A repetition of the dose after the effect of the first one has passed off causes a fall which is apparently uninfluenced by the first dose.

7. It is occasionally noticed that a large dose may cause a fall of temperature which is smaller but more prolonged than that caused by a smaller dose.

8. In guinea-pigs cooling appears to retard the fall of temperature caused by the drug, and also to retard the return to the normal.

9. The temperature of animals exposed to a heated atmosphere is but little affected by aconite; in fact, large doses may diminish the resistance of the animal to the effect of external heat, and cause the temperature of an animal to rise higher than that of one to which no aconite has been given.

10. If the animal be exposed to cold when the drug is administered, the fall of temperature is both more rapid and more extensive than in the normal animal.

THE TREATMENT OF COLDS.

Dr. J. H. Whelan states in the *Practitioner* for March, 1887, that he has found a combination of belladonna, quinine, and arsenic almost specific in aborting common colds if commenced in the early stage of the affection, while it is still confined to the nose and pharynx. The formula which he uses is the following:

℞ Quininæ sulphatis, gr. xviii;
Liquoris arsenicalis, ♏xii;
Liquoris atropinæ, ♏i;
Extracti gentianæ, gr. xx;
Pulveris gummi acaciæ, q.s. ut fiant pilulæ xii.
Sig.—One every three, four, or six hours, according to circumstances.

Dr. Whelan states that at starting one pill should be taken every three or four hours, and later on every six hours, and he believes that if a catarrhal subject has a box of these pills always at hand he will almost invariably succeed in aborting a cold.

He does not profess to explain how his remedy acts, unless it be as a powerful nervine and general tonic.

THE USE OF HYDRASTIS CANADENSIS.

Fellner orders the fluid extract as follows:

℞ Ext. hydrastis fluid.,
Vini malagæ, āā ℥viiss;
Syrupi cinnamom., ℈xi. M.
Sig.—A teaspoonful or half-tablespoonful every four hours.

The alkaloids berberine and hydrastine are of similar action, and of these Fellner recommends berberine phosphate and hydrastine hydrochlorate as most soluble, in the following formulæ:

℞ Berberini phosphorici, gr. xv;
Dissolve in boiling water ℥v, and add
Vini malagæ,
Syrupi cinnamom., āā ℈iv.
Sig.—20 to 30 drops every two to four hours.

Also

℞ Hydrastine hydrochlorat., gr. xv;
Dissolve in distilled, boiling water, ℥iiss, and add
Aq. aurant. flor.,
Syrup. tolutan., or
Syrup. menthæ pip., āā ℈iv.
Sig.—15 to 25 drops every two to four hours.

—*Therapeutische Monatshefte*, January, 1887.

THE TREATMENT OF EMPYEMA WITH PULMONARY GANGRENE BY PERFLATION.

At a meeting of the Royal Medical and Chirurgical Society, held in London, March 8, 1887, Dr. Wm. Ewart and Mr. R. Fitzroy Benham read an account of a case of "Empyema with Pulmonary Gangrene following Enteric Fever treated by Perflation" (*Lancet*, March 12, 1887). The patient, a male, aged 10 years and 11 months, was seized with enteric fever (due, probably, to drain infection) on April 23, 1886. The symptoms were not unusual in character, but severe in degree, especially the delirium. The treatment adopted by Mr. Benham consisted of quinine, which proved ineffectual, and of antipyrin, which appeared to relieve the pyrexia and the delirium. The

patient was convalescing at the end of the fourth week, when peritonitis supervened, soon followed by left pleuritic pain. Within a week the signs of left empyema were fully developed, the exhaustion was extreme, and the dyspnœa bordered on asphyxia. On June 11 aspiration was made, and three-quarters of a pint of thick, shreddy pus removed, with relief of the most urgent symptoms. The following day the chest was opened freely in the anterior axillary line (fifth space), and in the scapular (ninth space), a large quantity of pus escaping. Free discharge continued, but no injection was used. On June 15 perflation was performed under spray, in the manner depicted in the *Lancet* (July 31, 1886), the appliances being elastic tubing, a Wolffe's bottle containing carbolic acid solution (1 to 10), and a hand-ball bellows. The air was delivered into the centre of the chest through the anterior opening, and allowed to escape only at the posterior. The result was the expulsion of fetid pus, of a piece of necrosed lung, and of heavy false membranes. A smaller mass of membrane was expelled by perflation the next morning, and a small piece on the third day. From this day the fetor ceased, and the amount of pus decreased rapidly. On the eighth day the discharge was turbid-serous, and it remained serous to the end. Both wounds were closed on the thirtieth day from the date of incision, and on the twenty-fourth from the first perflation. Among the advantages obtained in this case by the method employed were the following: 1. Early removal from the chest of putrid residues. 2. Presumably considerable shortening of the period of suppuration as a result of 1. 3. Avoidance of permanent atelectasis and of eventual resection of ribs as a result of 2. 4. Avoidance of deformity as a result of 3. 5. Daily dressings, free from discomfort and from wet (excepting the spray). 6. A dryer state of the cavity and of its coverings than is allowed by fluid injections, with absolute sweetness of the discharge.

The PRESIDENT asked what was the advantage of perflation over free incision at the most dependent part, with, if necessary, excision of the rib.

SIR DYCE DUCKWORTH believed the practice of washing out the pleura was a mischievous one. He would use perflation in future in that class of cases where, having made a free opening with antiseptic precautions, the patient did not progress satisfactorily.

MR. GODLEE thought the case peculiar, in that a piece of gangrenous lung was discharged without a history of previous fetid expectoration. He considered that a free opening posteriorly without perflation would have met the needs of the case. Injecting the pleura was a mode of treatment now passing out of fashion. In cases requiring it he recommended blowing iodoform into the pleural cavity with an insufflator.

MR. BENNETT inquired what was the result of treatment in adults and in those cases which, previous to its use, had not done well. He could not recommend its adoption in general surgery, for in one case in which he perflated an abscess in the thigh he produced extensive subcutaneous emphysema.

MR. R. W. PARKER had published a paper in the Society's Transactions many years ago advocating a similar method to this. He had abandoned injection, and made a single large opening, into which a double drainage-tube was passed.

DR. DAWTREY DREWITT likened perflation to the school-boy practice of "blowing" an egg, and pointed out the difficulty of separating the inner membrane from the shell by that method.

MR. HOWARD MARSH said he adopted the following method of evacuating an empyema: First make an opening high up; from this pass a catheter and feel the lowest part of the pleura; then make a large opening at this lower point, and allow the upper one to close. He believed washing out the cavity was not advisable, and, indeed, unnecessary. He objected to the insufflation of iodoform, which, he thought, might act as a poison. In excising a rib, if the periosteum were left, deformity would be avoided.

DR. SANSOM said the air would not be sufficiently purified by being blown through water. He advocated passing the warmed air over blotting-paper, cotton-wool, or sponge, saturated with pure carbolic acid.

MR. PEARCE GOULD thought the value of the method could scarcely be judged from one favorable case. He considered the best treatment was a single free opening in the sixth or seventh interspace and in the post-axillary line.

DR. EWART, in reply, agreed as to the value of a large opening. He believed perflation useful in recent empyema to discover whether loose pieces were present. In older cases it might be beneficial by effecting the removal of an irritant. He had treated five cases of left-sided empyema, and perflation in them had produced no effect on the heart.

In using this method in general surgery, care should be taken to have free openings, so as to avoid undue pressure.

THE ABSORPTION AND ASSIMILATION OF FOOD-STUFFS.

HOFMEISTER, of the German University of Prague, in a series of reports of work done in the Prague Institute of Pharmacology, writes as follows upon this subject:

Experiments upon animals which consume flesh have shown that a portion of their food is quickly assimilated through the agency of the mucous membrane of the intestine and stomach; and that as factors chiefly concerned in this assimilation are the epithelium of the gastro-intestinal tract and the cellular connective tissue, rich in lymph-cells. Following up his histological studies, Hofmeister has sought to determine whether changes in relative nutrition are attended by morphological changes in the mucous membrane, and whether such changes may not throw light upon the structure and nature of the elements composing these mucous membranes. The free absorption of certain materials by cells renders, under favorable circumstances, the cells and their contents visible; this occurs with glycogen and fat. This process may result either in a great enlargement of cell-volume or in greatly increasing the number of cells. In the first case, microscopic examination would afford a demonstration of the conditions present. The recognition of an increased number of cells can with certainty be early accomplished; the caution should always be borne in mind to avoid confounding increased cell-formation of normal glandular elements with the development of elements introduced from without.

Change in the Number of Lymph-Cells in the Intestinal Mucous Membrane under the Influence of Nutrition.—The experiments reported were performed upon cats. Two animals of equal age, growth, and nutrition were chosen, one of which was fed liberally with meat, the other was starved for several days. When time had elapsed for the assimilation of the food taken, the animals were killed, and portions of the digestive tract were hardened in alcohol. Slides were made of sections prepared, and the pylorus, duodenum, middle and extremity of the small intestine, appendix vermiformis, and large intestine were examined. The intestines of a number of cats in various stages of fasting and repletion were examined, pairs of animals and single ones being used for comparison, and osmic acid preparations were made. The result of these experiments was that fasting produced no effect upon the number of cells in the mucous membrane proper, while a manifest effect was readily observed upon the number of cells in the lymphatic connective tissue. This lymphatic tissue is much richer in cells in animals well fed than in those starving; and further studies have shown that this condition does not depend upon a temporary repletion, but upon the general condition of the animal's nutrition.

Differences in the number of cells in the lymphatic tissue are readily recognized where well- and poorly-nourished animals are compared, especially if the latter be fasting. They are easily recognized and plainly discernible when animals of equally good general nutrition are compared, of which one is in full digestion, the other hungry. These differences are not, however, to be observed with certainty when a well-nourished, but fasting, animal is compared with a poorly-nourished animal which has recently been abundantly fed. It is then hard to determine which is the predominant element in the result,—the temporary digestive repletion or condition of generally good nutrition.

Nutritive changes in the digestive tract are not equally apparent in all portions of its extent. The influence of digestion during the period of absorption is most plainly seen in the stomach and upper portion of the small intestine, while the influence of a general condition of nutrition is equally marked in all portions of the intestine.

The appearances of different portions of the digestive tract are, briefly, as follows:

In the stomach the subglandular lymphatic connective tissue in hungry animals is much smaller and poorer in cells than in those in full digestion. The fibrous tissue, which forms the basement membrane of the lymphoid tissue, in animals in full digestion is often covered with cells; in fasting animals it is plainly visible. The lymph-follicles in such animals are, when present, small, wasted, flattened against the mucous membrane, and the number of their cells greatly lessened; the follicles of animals in digestion are wide, oval, or bullet-shaped, and distended with cells. The tissue about the follicles, in digesting animals, is also rich in cells, and the lymph-channels likewise.

Small Intestine.—The differences in the contents of the adenoid tissue in animals fasting

and digesting, which is greatest in the upper portion of the intestine, shows itself most plainly in the abundance or lack of cells in the parenchyma of the intestinal villi, the subvillous and interglandular tissue, and, to a less extent, in the subglandular connective tissue. In fully fed animals the villi are broader, the glands of Lieberkühn distended with cells, the subvillous spaces crowded with cells. In fasting animals the villi are shorter or smaller, poorer in cells; the glands lying closely together, the subvillous spaces appear trabeculated, containing few cells, and these appearances are the more marked the longer the condition of hunger exists; these conditions are most readily seen on the surface or by cross-section of the mucous membranes. In the duodenum the solitary lymph-follicles were prominent in only two animals, and as these animals were in full digestion, comparison with fasting animals was impossible.

In the jejunum and ileum the influence of nutrition was most manifest in the lymphatics of Peyer's patches. After abstinence of several days they are plainly visible. In well-nourished animals during digestion the follicles stand closely together, raised above the surface of the mucous membrane, and easily recognizable. In fasting animals they are sunk into the submucous tissue, scarcely recognizable above the mucous membrane. On removing the superjacent tissues, so that the under surface of a plaque is exposed, if the animal be in full digestion, a grayish, glistening tissue is seen, which, when punctured, extrudes an abundance of milky fluid, clear and rich in cells. In fasting animals the contracted follicles are separated from each other by a white boundary substance, so that the plaque has the appearance of a net-work. On perforating such a plaque a watery fluid which contains but few cells is procured with difficulty.

On microscopic examination it is found that the changes observed in fasting animals depend upon a marked diminution in the number of cells contained in the follicles. Each individual portion of the gland was small, collapsed, cell-infiltration failed, the spaces between the segments of the cells were wide and showed trabeculæ of connective tissue; the villi shared also in this depletion. The glands of Lieberkühn were perpendicular to the surface of the mucous membrane, while in fully fed animals they are crowded one against another out of the perpendicular. The nutritive changes in the large intestine were like those of the small intestine; owing to the smaller amount of lymphoid tissue present they occur less frequently. By prolonged fasting it is difficult to recognize a diminution in lymph-cells, especially in the follicles of the appendix vermiformis. The fact of the increase in the number of cells in the adenoid tissue of the intestines may be explained upon two hypotheses,—that of the extravasation of leucocytes from the vessels during increased circulation; the segmentation of living protoplasm in the cells of the tissues.

If the first hypothesis were true, the largest number of cells would be found near the blood-vessels; this, however, is not the case. Further, the lymph cells within and without the blood-vessels should have the same structure if they are the result of extravasation; the cells contained in the capillaries and small vessels are multinuclear; while it is rare to find cells in the adenoid tissue of the intestine which are not uninuclear. It is possible also that the multinuclear cells did not escape from the blood as such, but that they were originally extravasated and formed as uninuclear cells.

Flemming has demonstrated the generation by proliferation of lymph-cells in the plaques of Peyer and in the large intestine; Hofmeister has observed the same phenomenon,—has counted as many as seventy cells in a single section, and so distributed that it is doubtful if a "centre of generation" was present. The single follicles of the stomach and small intestine showed the same germination, and confirmed the improbability of the existence of centres of generation; the lymph-channels were also filled with cells. The presence of such numbers of cells in those portions of the intestine which contain the follicles must depend either upon the accession of a great number from without, or the proliferation of cells independently of the follicles. It is highly improbable that these numbers of cells have been extravasated from blood-vessels or from the follicles, although the vicinity of Peyer's patches is always rich in cells: the facts indicate that in the mucous membrane of the intestine cells proliferate abundantly outside of the follicles, as the following observations show:

To avoid errors, safranin, gentian, or hæmatoxylin should be used as stains; care should be taken in sections cut obliquely through Peyer's plaques when it is difficult to distinguish free lymph-cells from those of the neighboring glands.

It is probable that nuclei of mother-cells

divide and separate themselves from the original protoplasm, forming in the process figures of various kinds observed in the crypts of the interglandular tissues. The fact that this process less often results in wandering lymph-cells leads to caution in their recognition outside of the follicles. It is, however, possible in thin sections to recognize clearly a large number of germinating cells in the lymphoid tissue wherever cell-infiltration is most pronounced. In the stomachs of well-nourished cats extra-follicular lymph-cells were found between and beneath the glands: the number was greatest near the pylorus. In the small intestine cells were found in the parenchyma of the villi and in the subvillous and interglandular tissue, but so poorly developed in the subglandular tissue as to be scarcely noticeable. They were found most frequently in the periphery of the connective tissue about the villi. The fact that karyokinesis occurs in the adenoid connective tissue of the intestine makes it unnecessary to suppose that the new cells so formed have their origin outside the intestine. The experiments narrated were repeated upon dogs, which showed a greater inter- and subglandular infiltration than in cats.

The conclusion reached by these experiments was that the autochthonous cell-development of the adenoid connective tissue of the intestines is greater than that of any other portion of the body.

The foregoing observations, however, point to this cell-proliferation as one of the assimilative functions of the intestine. They also prove that the process described is a proliferation of cells independent of lymphatics, as is shown by the difference in essential characteristics between the cells of the glands and the lymphoid cells. The writer has seen such cells in pure fibrillated connective tissue, in interglandular lymph-spaces, and mixed with blood-corpuscles in the capillaries at the bases of the villi. These lymph-cells are independent in their growth of all surroundings except their nourishing medium. Remembering that the tissues of the digestive tract draw their nutriment directly from the products of assimilation, the karyokinesis of lymph-cells appears as the morphological result of a series of chemical and assimilative processes, which culminates in the new organization of the cell. This conclusion is verified by the fact that these cells are present in great numbers among the epithelium of Lieberkühn's crypts; they are less abundant in the stomach, and still less abundant in the large intestine. Whether imputed to development for a specific object in the economy, or as a result of physiological processes, it is not difficult to understand.

The epithelia of the absorbing portion of the intestine are best situated for the consumption of its contents; in the second place are the lymph-cells of the adenoid tissue.

It is not alone in the intestines that lymph-cells assimilate nutritious matter; the mesentery and its lymph-follicles furnish a multitude of depôts where such activities go on. The intestine and mesentery together may be considered one large tubular lymphatic gland, the various parts of which have essentially the same function.

Flemming has shown that the mesentery absorbs nutrient matter and proliferates cells. The fact that lymph passes through chains of glands before reaching the blood explains the apparent riddle that absorbed material is found in the blood which is not present in the thoracic duct; each gland is capable of absorption and direct assimilation and transference to the blood.

The exact way in which this mesentery and intestinal gland apparatus performs its function we do not know; that it has an important bearing on the nourishment of the individual we cannot doubt.

The experiments just described show that the increase in lymph-cells is independent of the glands themselves, but is an assimilative function of the intestine; these leucocytes have been found in the trabeculæ of connective tissue, and mixed with white and red blood-corpuscles at the capillaries in the bases of the villi. These cells depend for their growth and nutrition, not upon the neighboring tissues, but upon the fluid or serum which circulates about them.

Inasmuch as the cells in question take no part in the composition of the blood and lymph, it is evident that these fluids contain in but small degree those elements upon which karyokinesis depends. When we consider that the difference between the interstitial lymph of the connective tissue of the digestive mucous tract and the fluid of the lacteals consists in the most recent products of digestion, and that the number of cells in the intestine sustains a relation to nutrition not fully determined, we are led to the conclusion that not only the increase in the number of nuclei and amount of cell-substance, but also karyokinesis itself, are direct products of digestion. Karyokinesis of lymph-cells appears, then, from this stand-point to be the

morphological and discernible result of a series of chemical and assimilative processes. The final act of this assimilation is the new organization of the cell.

With the above an observation already noted fully agrees. The lymph-cells which have been described are most abundant at Peyer's plaques, less frequently found in the gastric submucosa, and rarely present in considerable numbers in the tissues of the large intestine. The writer has repeated the work of Heidenhain, and found that the great increase in the lymph, whether existing for a definite end or as the result of a physiological plethora, is easily explained by reference to the condition of nutrition. The epithelia of the absorbing portion of the intestinal tract are most favorably situated for absorbing nutrient matter; next after them are the lymph-cells of the adenoid connective tissue.

The adenoid connective tissue is only, however, the first halting-place at which lymph-channels come into relationship with nutrient material. That which is not appropriated follows the lymph-currents to the mesenteric glands. These bodies are so situated as to intercept the lymph which passes from the intestines to the thoracic duct. In suckling animals, along the bases of the mesentery the lymph-channels converge in such a manner that it is evident that a special mechanism is here constructed for the reception of nutrient matter, both finely divided and dissolved. The lymphoid connective tissue and the mesenteric glands seem to be portions of the same apparatus, having the same function.

Flemming has already shown that an abundant proliferation of cells occurs in the mesenteric glands. It is not, however, possible to carry out the analogy with the lymphoid tissue of the intestine, and show that *pari passu* with cell-proliferation nutritious matter disappears. It is evident that the lymph-channels afford greater obstacles to the general diffusion of nutritious matter than do the blood-vessels, non-diffusible fat, for example, passing through the lymph-channels, and it is somewhat enigmatical that certain products of digestion, as peptone, are often found in the blood and never in the chyle of the thoracic duct.

When we consider, however, that products of digestion must pass through a chain of lymph-glands, which retain such matter, and apply it to the production of new cells, these phenomena are more intelligible. In the light of such investigations, the great lymph apparatus of the intestine and peritoneum seems to be especially adapted for the most useful and economical assignment of nutritious matter, acting, as it does, as an intracellular transport. The precise method of this action we do not, as yet, know. Its importance to the bodily economy may be inferred when we consider the value, in the body, of the numberless cells contained in the intestines and their glands.

Regarding the function of the peripheral lymph-glands there are two theories worthy of attention. One of these theories depends upon the facts observed regarding the dependence of the numbers of cells upon digestion and nutrition. We should then ask whether, inasmuch as the nutritive changes in the adenoid connective tissue coincide closely with the period of digestion, this cell-proliferation is to be regarded as the result of the increment of nutritious matter? Should not the full development of nutritive processes result in a much more widely-spread diminution in the number of cells than we have just observed? A closer observation shows the proposed coincidence between digestion and cell-growth when it arose from introduction of lymph-cells from without, or the extravasation of leucocytes from the blood. Lymph-cells are plainly formed in the place and situation where nutrition goes on, but no such coincidence as that mentioned can occur, for the reason that cell-proliferation and karyokinesis persists for hours after absorption of nutritious matter. In this wise also it happens that the mucous membrane of the intestines for days after the last ingestion of food contains unassimilated matter in small quantities, and is thus in a position to continue proliferation. It is not surprising that, after an abstinence of a day or two, the contents of the adenoid connective tissue are only partially depleted of lymph-cells. With the disappearance of ingested nutritive matter from the intestine the assimilation and absorption of nutritive matter does not cease, but it happens, to make use of a comparison, material brought fit for the mint is coined and put into circulation again and again. It is evident that such an arrangement provides for the nutrition of the tissues in the pauses in the reception of nutrient matter. To ascertain to what extent abstinence influences cell-proliferation the experiment was made of subjecting an animal to hunger for fourteen days; there results a general lessening in the number of lymphoid cells, but even an abstinence of seventeen days, producing inanition, did not entirely remove them. Through still longer

continued hunger the mucous membrane of the intestine lost an amount of cell elements, which reduced the volume of the villi and glands to two-thirds, and lessened the circumference of the bowel. The infiltration with lymph-cells sustained a considerable loss, which fell more upon stationary lymph-cells than upon those merely formed in the connective tissue. The actual loss in the constituents of the follicles was a relative one and not absolute; it was seen in cross-sections of the tissues, and also in counting the cells extruded in the fluid from the follicles. The atrophy of the follicles may be so great that, in comparison with the newly-formed lymph-cells, the cells of the follicles may disappear entirely, and even the cells remaining may show a diminished circumference and a smaller amount of coloring element. The statement that the formation of lymph-cells does not depend entirely upon nutrition leads to the following considerations: if the adenoid connective tissue, including the peritoneal glands, receives a portion of the nutritious matter, what portion should be allowed that numerous lymphatic array, which, like the peripheral lymph-glands, are not enriched by nutrient matter in the intestinal lymph? The answer to this question is in full accord with what has been said. It can happen that a portion of digested matter enters the blood and disappears first in the capillaries of various organs. If the quantity of peptone resulting from digestion is too great for ready assimilation, or the adenoid connective tissues already overstocked, a portion of the peptone may enter the venous circulation unchanged, and be sent from the heart through the organism; it can also happen that the tissues may transfer non-assimilated peptones to the efferent lymphatics, and this peptone, on its way to the general circulation, may be intercepted by lymphatic glands, where it is retained and assimilated, as happens in the intestinal and mesenteric glands.

What has been said of peptone absorbed in the intestine is true of other substances which behave similarly.

In accordance with the great diversity in the arrangement of the tissues, as well as by their functional differences, it will scarcely be credited, as that which is half unknown so often happens, that from the waste of active cells, as well as excrementitious matter from the blood, the chemical changes follow after the same rules, and invariably bring it to pass that at the location and place of the cell are produced the final products of cell-activity, —carbonic acid, urea, and water. There are also many intermediate products of decomposition in greater or lesser amounts, which if not wanted at one portion of the body may be useful at another. Schmiedeberg, Bunge, Waldemar von Schröder, Mirkoraski, and Max von Frey have shown that the transition of these substances into excreta does not always occur in the same amounts, but more often at certain regions of the body which seem designed for this purpose. The products of decomposition, when they find no acceptance where they were produced, enter the stream and reach the lymphatic glands, and there undergo a process which renders them fit for the production of new cells. What is not accomplished at the lymphatic stations takes place in the blood, and at every station where an excretory product is developed. From this stand-point there is no necessity for the peripheral lymphatics to differ in function from the mesenteric; their function is different only in this, that they do not draw from the contents of the intestine, but gain their nourishment from the excess and overflow of other organs. During prolonged periods of digestion quantitative experiments may be done in part. The lymph apparatus of the intestines during hunger takes its nutrition from the residue of the intestinal wall, and is in this degree comparable to a normally-acting peripheral lymph-gland.

It is, therefore, not remarkable when the new formation of lymph-cells does not entirely cease in these lymphatics; and hence there is room for doubt whether the passage of nutrient material from the intestine is ever absolutely in suspense during hunger, although it may sustain a great reduction.

Many anatomical and pathological facts indicate that many lymph-glands always or occasionally assume important but different functions. Especially interesting is the development of adenoid connective tissue in mucous membranes not designed for absorption; the explanation of these facts demands further investigation.—*Archiv für Experimentelle Pathologie*, February 8, 1887.

INDICATIONS FOR THE USE OF NITRO-GLYCERIN.

Dr. Trussewitsch, in an instructive paper on the use of nitro-glycerin published in the *St. Petersburger Medicinische Wochenschrift*, points out that the value of this drug in various affections—angina pectoris, migraine, and neuralgia (which he describes as angio-

neuroses), as also in sea-sickness, some forms of anæmia, faintness, palpitation, and other diseases—depends upon the existence of an irregular distribution of blood, which condition may be inferred from a certain degree of pallor of the skin, especially of the face, often coexistent with a weak pulse and a small rigid radial artery, which frequently is situated at some depth. When, on the other hand, headache and neuralgia occur in patients with chronic congestion of the subcutaneous veins of the face, nitro-glycerin is to be avoided; and similarly it is of no use in asthma, when the face is reddened in consequence of emphysema. If, however, a pale face exists with angina pectoris, migraine, giddiness, shock, toothache, or sea-sickness, the best results may be looked for by giving nitroglycerin. The regulating effect of the drug exercises an influence over the congestion of internal organs similar to that brought about by blood-letting; and in these congestions, whether of lung, brain, or kidney, when they are of a temporary character, the pulse is generally found to be slow and of low tension,—a fact which, as the author remarks, is sufficiently well known in reference to the fever-free periods of acute hyperæmia of the lung and kidney. Dr. Trussewitsch lays down as a rule that the condition of the pulse is the best indication for the employment of nitroglycerin, and the most trustworthy guide as to the dose with which to commence the treatment. The smaller the radial artery is, the more rapidly it dilates under the action of the drug, and the less the secondary effects proceed; on the other hand, the fuller the pulse with a distended radial artery, the less it is affected; and, finally, the softer the artery with a weak pulse, the greater the secondary and the less the general effects. Single-drop doses of the one per cent. solution are sufficient in cases of small pulse, but with a full pulse it will be found that the full effects cannot be produced with less than 2-drop doses. When there is a soft artery with a weak pulse, subnormal doses only should be given,—a quarter to half a drop. After the trial dose is given, the patient's sensations of pulsation and pain in the head, as well as the distention of the radial artery under the finger of the physician, will be the guides for increasing the dose. The author finds that the best modes of administering nitro-glycerin are the simple dropping of the solution on the tongue and by means of tablets; much less satisfactory results were obtained when given mixed with water.—*Lancet*, February 19, 1887.

TESTS FOR ANTIFEBRIN.

Yvon has employed the following tests: Good specimens of antifebrin must be white or pale yellow in color and odorless. To detect the presence of a trace of unchanged aniline, which is poisonous in its effects, a little antifebrin is rubbed up with water, and sodium hydrobromide added. If the specimen is pure, the fluid remains clear and yellowish in color. If aniline is present, an abundant, reddish-orange precipitate is formed, and the supernatant fluid has a like color.

A reaction, which proves the identity of antifebrin, consists in heating it with mercuronitrate, when a green coloring-matter forms, soluble in alcohol. The same reaction may be applied to the examination of urine by shaking the urine with chloroform, and heating the solid residue with mercuro-nitrate. This test shows even traces of antifebrin.—*Pharmaceutische Zeitung*, March, 1887.

THE PROGNOSIS IN CASES OF HEART-DISEASE.

In the *British Medical Journal* for February 12 and 19, 1887, Sir Andrew Clark reports a long series of cases of valvular diseases of the heart known to have existed over five years without causing serious symptoms, from a study of which he draws the following conclusions:

"1. That there are many persons with long-standing valvular disease of the heart, engaged in the active business of life, who without any symptom of heart-disorder have enjoyed good health and have reached an advanced age.

"2. That the mitral regurgitant murmurs so often encountered in chorea, for the most part disappear within eight or nine years of the attack.

"3. That valvular inflammations, and their effects arising in the course of rheumatic fever, do sometimes disappear, and leave behind no clinical evidence of their former existence; and that this occurring for the most part in the young, also occurs sometimes in the middle-aged.

"4. That the signs of valvular defects arising out of the degenerative changes of middle life do also, on rare occasions, disappear, and that, when circulatory and respiratory disturbances accompany their commencement, they sometimes subside, and permit of apparently complete readjustment.

"5. That as there must be in the histories, habits, occupations, and surroundings of patients with valvular disease conditions

which in one case bring about secondary disorders, and in another case exempt it from them, it is desirable that the respective *differentiæ* should be discovered and made capable of application to practice.

"6. That any systematic and critical study of this subject likely to lead to practical issues could be undertaken only by the Collective Investigation Committee, and not by it unless actively assisted by experienced general practitioners who possess, in a special manner, the knowledge necessary to the end in view.

"7. That a joint inquiry of the kind proposed, conducted with due patience, discrimination, and accuracy, would greatly extend our knowledge of the natural history of diseases of the heart, and largely increase our means of assisting those who suffer from them."

IODIDE OF SODIUM.

Iodide of sodium is considered by DR. RICHARDSON as a valuable substitute for, or adjunct to, iodide of potassium. In chronic eczema and painful rheumatic affections it often answers well when iodide of potassium does not agree with the digestion. Combined with arsenic it is useful in lepra and psoriasis. Externally applied, in cases of indolent ulcer, chronic syphilitic sores, and offensive discharges from the nostrils, it acts as a good antiseptic. The following is given as a useful formula for the purpose: Sodium iodide, ℥ss; tincture of myrrh, ℥i; rectified spirit, ℥ii; distilled water, ℥vi. To make a solution of eight ounces. Used in the form of fine spray from Seigle's steam spray-inhaler, Dr. Richardson found it of the greatest service in a case of syphilitic ulceration of the fauces.—*The Provincial Medical Journal*, March 1, 1887.

SPARTEINE.

DR. GLUZINISKI, in a preliminary note published in the *Przeglad Lekarski*, gives the results of some observations, both physiological and clinical, on the action of sulphate of sparteine. Its main action is to slow the heart; besides this, it raises the blood pressure. On cold-blooded animals it acts with a greater degree of intensity than on mammalia. The action on mammalia may be divided into three periods or stages, during the first and last of which the effects are more marked than during the second. Indeed, in some cases the heart is even quickened during the second period. This may be explained by the existence of some abnormality or pathological change in the irritability of the vagus or of the heart-muscle. The reflexes are at first increased, afterwards diminished. Death occurs from asphyxia, and is due not only to the effect on the medulla, but to that experienced by the respiratory muscles. The therapeutic use of sparteine is limited to the first stage of its action. Its value consists in the rapidity with which it acts. In some cases, within an hour after the first dose, the pulse begins to improve, as well as the subjective sensations of the patient, and no irregularity is produced. Sparteine has not so powerful an action as digitalis. It may, however, be useful in cases where the condition of the patient renders it unadvisable to wait for the more tardy effect of digitalis, and it may therefore be used as an adjunct to the latter drug, besides which it may be prescribed where circumstances exist which contra-indicate the use of digitalis.—*Lancet*, February 19, 1887.

SUCCESSFUL TREATMENT OF HYPERPYREXIA IN ACUTE RHEUMATISM BY THE COLD BATH.

At a meeting of the Clinical Society of London, held February 25, 1887, DR. CARRINGTON read a paper on the above subject. He said that although there was nothing new in the case he brought forward, still he thought it was well to put such cases on record, in order to accumulate a body of evidence such as would enable medical men to combat the prejudice existing among the friends of patients against the employment of a remedy which afforded the only chance of safety in this desperate complication. The patient was a medical student aged 23, strong and muscular, and hitherto in perfect health. He had been ill with what was apparently a mild attack of rheumatism, for which he had been treated by salicylic acid. He was so far recovered that he had left his bed, and on the evening of October 31 had received the visits of his friends. He passed a good night, and there was nothing to excite attention next day; but on taking his temperature next morning about twelve, noon, quite as a matter of routine, it was found to be 107° F. Dr. Carrington saw him soon afterwards, and then found the temperature to be 106°. He was, as soon as practicable, removed to the private ward of Guy's Hospital, but during the journey had become noisy and delirious, and by the time he had been placed in bed

he was quite livid, unconscious, and generally convulsed. His temperature was then found to be 109.8°. The necessary arrangements had been previously made, and he was at once placed in a bath at a temperature of 70°, which was as rapidly as possible cooled down by ice. Large quantities were used, but the body heat was so great that there was great difficulty in lowering the temperature of the bath. Pouring ice-cold water on the patient's head had a beneficial effect. A rectal injection of 15 grains of antipyrin was administered. He was kept in the bath for a full hour, and when the rectal temperature was 102.4° he was removed and placed on a blanket, and lightly covered by a sheet. Then marked tetanic convulsions supervened, and he gradually became quiet, and at 7 P.M. his temperature fell to 97.2°. At 8 P.M. consciousness returned, and he took a pint of milk, and at 10 P.M. he was quite rational. During the next day he remained comfortable, and took gr. xx of salicylate of sodium every two hours, but his temperature again rose, and at 12 P.M. it was 103.8°. He was given gr. xv of antipyrin by the mouth, but at 2 A.M. the temperature was 105.2°, and the ice-bath was again employed for fifteen minutes. He was taken out when his temperature had fallen to 101°, but at 6 A.M. it had again risen to 105.4°, and the bath was again had recourse to for a similar period. After this he slept well, but at 2 P.M. the temperature had reached 105°, and he was bathed again for forty minutes. From this time the temperature never again rose to any extent; it was for the most part normal, but on one occasion, with a return of the articular pain, it reached 101°. After the third bath, salicin was substituted for sodic salicylate, in 25-grain doses every two hours. After two days he took it every three hours, and the dose was gradually reduced. With an interruption due to the slight relapse, the patient made an uninterrupted recovery from this time, and left the hospital quite well. The experience of the case seemed to be that within the limits of collapse prolonged immersion was more effectual than shorter and more frequent baths.

DR. HALE WHITE said that the failure of salicylate of sodium and antipyrin was of interest, as leading us to see in some manner the way in which those drugs acted. In rheumatic pyrexia, at any rate, they were not of value. It was possible that it would by and by be discovered that each drug was applicable to a particular class of cases.

The PRESIDENT said that he had not seen convulsions occur during the rise of temperature. He had seen them come on during the cold bath in a case which ultimately proved fatal, and he had seen hyperpyrexia supervene during the use of salicylate of sodium.

DR. HUGHLINGS JACKSON wished to know the exact nature of the convulsions, and particularly whether they were tonic or clonic, or both.

DR. STEPHEN MACKENZIE said he had had three or four cases of hyperpyrexia in private practice, and could endorse the remarks as to the difficulty of the cold-water treatment in private practice. He had succeeded in reducing the temperature to normal, but they had all terminated fatally. Those cases required the most careful supervision. The convulsions were invariably tonic.

The PRESIDENT said the convulsions took the form of opisthotonos, without clonic convulsions.

DR. CARRINGTON said in reply that the convulsions came on after the patient had been removed from the bath. The first bath lasted a good hour, as a great difficulty was experienced in reducing the temperature of the bath. He thought the antipyrin did more harm than good by favoring collapse. The salicylate did not appear to have had much effect either way. He thought antipyrin was a dangerous drug.—*British Medical Journal*, March 5, 1887.

THE PHYSIOLOGICAL ACTION OF SPIGELIA, OR PINKROOT.

Although spigelia has been frequently studied from a clinical point its physiological action has received no attention, and we reproduce, therefore, almost in full the studies made on this subject by DR. H. A. HARE, and published in the *Medical News* for March 12, 1887.

When as much as three ounces of the fluid extract of spigelia is given by the stomach to a large dog weighing forty pounds, the following symptoms appear: Almost immediately after the ingestion of the dose the animal has short and quick expiratory movements, amounting almost to a cough; soon after the pupils become widely dilated, and at the same time very marked internal strabismus asserts itself; the eyes becoming fixed in this position so that they cannot follow any object, such as a pencil, when it is passed from side to side. Constant retching, with no result,

now comes on, the animal standing, and apparently suffering from no sensory or motor palsy. There is no change in gait. Soon after this marked exophthalmia develops itself. The retching having lasted about five minutes, now passes off, and at this time signs of muscular weakness and lack of co-ordination appear; the walk becomes staggering in both fore and hind legs. The respirations now become very rapid, resembling those of a dog after a long, hot run, the tongue hangs from the mouth and is dry and red, and the nose is hot and no longer moist. Muscular power is progressively lost, so that the dog frequently falls when endeavoring to walk, but sensation does not seem to be affected. About this period the animal lies down and passes into deep sleep, which in turn soon passes into coma, and death follows without any movement being made, evidently from a general failure of vital force. The respirations as death approaches become slow, and are finally extinguished consentaneously with cardiac arrest.

In the frog the same symptoms occur as in the higher animal, including the marked exophthalmia and to a less degree the strabismus. The fixation of the eyeball is extreme, and it feels to the finger like a hard knob, which the lid cannot cover. Muscular weakness with dropping of the jaw comes on, and motor power is constantly decreased, until the batrachian lies relaxed and powerless. That the action of the drug in thus destroying motor power is spinal was proved by the following experiments: If the hind legs are protected from the poison by ligation of the abdominal aorta, the palsy is as great as under ordinary circumstances, and reflexes are totally abolished. Further, if the spinal cord be directly galvanized no movements occur in the hind legs; and, lastly, if strychnine be injected into the body, even in large amount, its action is not only slight, but occurs after the lapse of many minutes. That the drug has no action on the motor nerves is proved by the fact that when the poison reaches the efferent nerves, either through the circulation or when directly applied, galvanization of the nerve-trunks causes normal contractions in the tributary muscles, and the sensory nerves likewise escape, for if the drug be applied directly to the nerve and the foot irritated, signs of pain are elicited, and reflex movements occur. Further than this, if the vein in the leg be tied and the drug injected into the limb, thus protecting the spinal cord, reflexes occur on irritation of the drugged foot.

That the palsy is not cerebral is proved by the fact that movements of muscles supplied by the cranial nerves continue long after the movements in the legs have ceased, and by the other experiments already detailed.

The action of the drug on the circulation is as marked as its effects on the nervous system, and on the cardiac muscle it acts as a direct depressant poison, for if it be injected into the jugular vein in such a way as to come suddenly in direct contact with the heart the movements of that viscus almost instantly cease. Further than this, if the excised heart of the frog is dropped into a strong solution of the drug its movements are almost immediately stopped in a condition of diastolic arrest, although the relaxation is not very marked. When a frog receives as much as twenty minims of the extract of spigelia the heart is slowed to a considerable extent, as much as ten or fifteen beats per minute, and diastole, while not increased in length, is nevertheless very full and marked. The change from systole to diastole is abnormally rapid, so that the heart in one moment in systole springs with a quick movement to its full diastolic condition. Systole, however, gradually increases on diastole, in much the same manner as in digitalis-poisoning, until finally the greater portion of the ventricle fails to dilate, the apex being tilted more and more forward while the ventricular walls are powerfully contracted. As the systolic pauses increase, the diastolic movements decrease in volume, until finally the heart dilates no more than it does normally. At this time the powerful and heretofore spreading systolic contractions seem to lose power and the heart shortly stops all movement in a semi-relaxed state. Experiments on the warm-blooded animal show that on the injection of one drachm, or less, of the drug the action of the heart is very rapidly slowed in its movements, and that this slowing is chiefly due to central inhibitory stimulation is shown by the fact that if the vagi be cut before the drug is given this slowing does not occur, and also if after the drug has slowed the heart the vagi be cut the inhibition no longer remains.

That the fall of arterial pressure produced by this drug is due in great part to the cardiac depression which it produces is proved, since asphyxia will cause a rise in pressure, and that the pressure returns nearly to normal as soon as the heart gets rid of the drug which has been suddenly injected into it. On the respiratory centre the drug seems to have a still more depressing influence,

respiration ceasing some moments before the cardiac arrest.

EUCALYPTOL IN PHTHISIS.

BOUVERET has employed hypodermic injections of eucalyptol in the treatment of phthisis. The daily dose of the antiseptic has varied from 1½ grammes to 2½ grammes. The duration of the treatment has been from fourteen to sixteen days. Sixteen cases of phthisis were treated by this method; six of the number had fever, and the remaining ten were without fever. There was rarely any local disturbance at the site of injection. It was certain that the antiseptic was absorbed; it could be detected in the breath, but not in the urine. Albuminuria was not observed as the result of the treatment. It is very doubtful whether the number of bacilli was altered in any way by the method of treatment. Sweating, as a rule, was diminished. Its chief effect is as a balsamic preparation on the bronchial secretion, which it influences favorably. MM. Perret and Chabbannes have made experiments with the five per cent. solution of eucalyptol, injecting a mixture of it with tuberculous matter under the skin of guinea-pigs. The general conclusion at which they have arrived is to the effect that the antiseptic is utterly insufficient to prevent the activity of the micro-organism that causes artificial tuberculosis.—*Lancet*, February 19, 1887.

DERMATITIS VENENATA CAUSED BY LEUCANTHEMUM VULGARE.

Leucanthemum vulgare is the name of one of our common plants which is known in different localities as white-weed, or field daisy, and is plentiful in New England and the Middle Atlantic States and is spreading rapidly over the entire country.

In the *Boston Medical and Surgical Journal* for March 10, 1887, Dr. James S. Howe calls attention to the fact that this plant is capable of producing in certain persons a marked inflammation of the skin closely similar to that produced by rhus, dogwood, and sumach, and he thinks it is possible that many cases which have been attributed to these latter plants may perhaps have been produced by the field daisy. He reports four cases, himself among the number, in which severe dermatitis was produced.

THE SIGNIFICANCE OF THE RETENTION OF THE MEMBRANES AFTER LABOR.

The importance to be attached to the retention in the uterus of portions of membrane after the completion of the third stage of labor has been variously estimated by different obstetricians, some—*e.g.*, Winkel, Dorn, Ahlfeld, and Graefe—holding that grave dangers are to be apprehended when this occurs, while others—as Alshausen, Credé, Fischer, and Cohn (who has reported two cases in which nearly the whole membrane had been retained for five days without causing any pyrexia)—believe that little or no danger of hemorrhage, septicæmia, or other puerperal mischief is caused by the retention of even considerable portions of the membrane. An explanation of this divergence of view has recently been attempted by Professor Lazarevich in the opening article of the new Russian *Obstetrical and Gynæcological Journal*. His explanation is founded on the fact, unrecognized by most obstetricians, that "the membranes," even at the full term, are composed of and more or less separable into three distinct layers, representing the chorion, the decidua, and the amnion. The strength of these has been investigated by Poppel, Duncan, and Ribemont, and the amnion shown by them to be much tougher than the chorion in conjunction with the decidua. Professor Lazarevich has also made a number of researches on the subject by means of an apparatus consisting of two rings covered with india-rubber, between which the membrane to be examined was stretched, the resisting force being estimated by means of a wooden hemisphere on which weights were placed, which the membrane was made to support, more weights being added until it gave way. These observations showed that the integrity of the ovum depends almost entirely on the amnion. During labor some separation of the membranes from one another usually occurs; and this is especially the case when the chorion, split or torn below, maintains a close connection with the decidua, and the decidua with the uterine wall. The progress of the labor also separates the amnion from the chorion. Roemer explains the separation of the membranes from one another by their unequal elasticity; and Professor Lazarevich believes that the chorion, being less elastic as well as more easily torn than the amnion, is frequently ruptured in several different places, some portions coming away attached to the amnion, and some being left behind, attached to the uterus. The causes of retention of the chorion

with the decidua are,—1, the presence of villi on the chorion; 2, extravasation of blood on the decidua, with consequent formation of fibrous adhesions; and, 3, adhesions in consequence of endometritis and choriitis. The amnion may be retained in consequence of,—1, occasionally occurring adhesions between it and the chorion and decidua; 2, early rupture and escape of all or part of the liquor amnii; 3, a low attachment of the placenta or placenta prævia; 4, intra-uterine manipulation; 5, anteversion of the uterus after the birth of the child; 6, exceptional weakness or thinness of the amnion. Retention of the decidua (which is formed from the uterine mucous membrane, not from the ovum) is, as a rule, of little moment, though it is perfectly possible for endometritis decidualis to occur, and for the retained portions of the decidua to serve for the development of micro-organisms introduced from without. Shreds of the chorion, if retained either by themselves or together with the decidua, do little harm, as they rapidly undergo chemical and mechanical destruction, and are carried away with the lochia. The amnion, when retained, is much more liable to become the developing ground for bacteria, and it is to the retention of this part of the membranes that alarming symptoms are usually due. Professor Lazarevich lays considerable stress on the importance of straightening or replacing the uterus in its proper position after the birth of the child, before the after-birth comes away.—*The Lancet*, March 12, 1887.

EUGENOL AS AN ANTISEPTIC.

According to Geo. H. Ochse, Ph.G., eugenol, the principal component of oil of cloves, is found also in *Myrtus pimenta* (*Pimenta officinalis*, Lindley), *Amomis acris*, Berg (*Myrcia acris*, DeCandolle), *Canella alba*, Murray, *Dicypellium caryophyllatum*, Nees, and in *Ravensara aromatica*, Sonnerat. Eugenol,

$$C_{10}H_{12}O_2 = C_6H_3 \begin{cases} OCH_3 \\ OH \\ CH.CH.CH_3, \end{cases}$$

a phenol-like compound, is insoluble in glycerin and water, and is obtained as residue when oil of cloves is subjected to distillation with strong caustic alkalies. After the so-called light oil of cloves is distilled off, sulphuric or phosphoric acid is added, and by continuing the distillation without access of air eugenol is obtained. Eugenol is an oily, colorless liquid, possessing the odor and taste of oil of cloves in the highest degree. In contact with air and light it soon acquires a brown color; it boils at 247.5° C., and has a specific gravity of 1.078 at 0° and 1.063 at 18.5° C. Like phenol, which it resembles very much, it has no acid reaction, does not contain the group COOH, and also forms crystallizable compounds with alkalies. When heated with hydriodic acid it evolves methyl-iodide, and when fused with potassium hydrate it forms protocatechuic acid, $C_6H_3(OH)_2COOH$; with baryta and tin-dust it forms about ten per cent. methyl-eugenol. When taken internally the greater part of it is eliminated by the urine, in which, however, it cannot be detected by its odor nor by distillation, but, if allowed to decompose, the characteristic odor is at once perceptible, and when extracted with alcohol shows the characteristic deep-green coloration with ferric chloride. Eugenol has been given in doses of 3 grammes per day dissolved in alcohol and diluted with water. As an antiseptic, it is superior to phenol; as a febrifuge, it is not as efficacious as quinine, salicylic acid, antipyrin, or thalline.—*American Journal of Pharmacy*, March, 1887.

PNEUMOTOMY IN PULMONARY ABSCESS.

Dr. Runeberg, Professor of Medicine at Helsingfors, in a clinical lecture which has been published in a Swedish journal published in Finland, gives an account of a case of pulmonary abscess consequent on acute pneumonia, where he had performed pneumotomy with success. In addition to this he had collected notes of ten other cases. Leaving aside three of the eleven on account of uncertainty in the diagnosis, five of the remaining eight recovered, or, at all events, improved very decidedly, and in the rest, which were fatal, death could not in any way be attributed to the operation; so that Dr. Runeberg considers that when the diagnosis of pulmonary abscess is clear, and it is in an accessible situation, the best practice is certainly to open it. He then refers to the question of operating for gangrene of the lung. He himself had had a case of this, together with bronchitis and bronchiectasis. After the operation secondary gangrene and septicæmia occurred, which proved fatal. In seventeen other cases of gangrene he quotes from medical literature where pneumotomy was performed, seven recovered more or less completely, and the fatal termination of the remaining ten did not appear to have been attributable to the surgical interference. As

to the method of opening the lung, Dr. Runeberg is in favor of resecting a rib, and then using the thermo-cautery. He does not approve of washing out the cavity with antiseptic lotions, thinking them dangerous, and believing that ample drainage is sufficient. In conclusion, he mentions several pneumotomy cases he had collected: two were for ecchinoccocus, both terminating favorably; six were for bronchiectasic cavities with gangrene; and six for tubercular cavities. In the latter two classes of cases he does not think operative procedures are advisable.—*The Lancet*, February 12, 1887.

FERMENTS IN MILK-JUICES.

A. HANSEN has examined the latex of different species of plants for the presence of ferments. He finds none in the Euphorbiaceæ, in *Ficus elastica*, Scorzonera, Taraxacum, or the juice of the opium poppy. The latex of *Ficus caricà*, on the other hand, contains principles capable of effecting four fermentative changes; they peptonize albuminoids in the presence of either alkalies or acids, act like diastase on starch, and coagulate the casein of milk. Twenty to one hundred grammes of fibrin, previously caused to swell by immersion in hydrochloric acid of 0.2 per cent. strength, are completely dissolved in ten to thirty minutes when treated at 40° with two to three cubic centimetres of this latex. The products of this digestion are the same as with pepsin; yet the two ferments are not identical, since the Ficus latex peptonizes in presence of alkalies as well as acids, although more slowly. Probably there are two peptic ferments present, one acting in acid, the other in alkaline, solutions.

By digestion with hydrochloric acid the latex entirely loses its peptonizing properties; digested with sodium carbonate (which destroys the activity of pepsin), it retains them intact. If a few drops of the latex be added to milk, which is then raised to the boiling temperature, the casein is at once precipitated. Incipient ebullition, therefore, does not destroy the curdling power of this latex, although prolonged ebullition does, and even a temperature of 65° if continued for two hours. The diastatic action of this latex is demonstrated by the partial transformation of starch-paste and glycogen into sugar. When the latex is precipitated by alcohol, and the precipitate taken up with water, the action on milk and on starch is found to persist, while that on fibrin disappears.

The latex of *Carica papaya* peptonizes, precipitates casein, and transforms starch into sugar.

The author does not consider that these vegetable ferments play any *rôle* in the nutrition of the plant.—*American Journal of Pharmacy*, March, 1887.

THE MECHANISM OF THE THIRD STAGE OF LABOR—THE SEPARATION OF THE PLACENTA.

At a meeting of the Obstetrical Society of London, held March 2, 1887, DR. CHAMPNEYS read the first of a series of papers on the above subject, reviewing the facts furnished by our knowledge of the clinical course of natural labor, and by that derived from Porro's operation (*British Medical Journal*, March 19, 1887). From the former it was known that, until the birth of the head, the placenta was not detached, and that after the birth of the head it was not at once detached. Leinser found, by examination of one hundred and sixty-eight women, that the placenta was completely detached as soon as the child was born. As regards Porro's operation, the inferences drawn from it must be regarded with suspicion, on account of the great interference which had taken place with the uterus. The facts derived from these two sources did not tally. He next discussed the theories of the cause of placental detachment: A. By contraction and retraction alone, through reduction of the placental site. B. By contraction and retraction indirectly: (*a*) by separation of the centre, which was less firmly attached than the edge, leading to aspiration of blood; (*b*) by squeezing blood towards the surface during contraction; (*c*) by rapid diminution of intra-uterine pressure, consequent on the birth of the child. C. By detrusion (Leinser), the placenta being forced in the direction of least resistance, namely, the axis of the parturient canal. He then discussed the theories of the modes of placental detachment: A. According to the situation of the placenta. B. From the edge. C. From the centre. D. According to the firmness of attachments of its parts. He then considered the evidence furnished by the various facts, and showed that the question was whether the separation of the placenta was independent of rupture of utero-placental vessels as a cause. The decision depended on (*a*) proved hemorrhage behind the placenta in normal labor; (*b*) on the mode of expulsion of the placenta. He concluded that hemor-

rhage to a moderate amount played a certain though subsidiary part in the mechanism of the detachment of the placenta.

METHYLAL.

Methylal is a fluid of specific gravity 0.855; its vapor density is 38°, taking hydrogen as a unit, and a boiling-point of 42° Cent., 107.6° Fahr. Its solubility in blood is one part in three; its composition is $C_3H_8O_2$. It is made by distilling methylic alcohol with sulphuric acid in the presence of peroxide of manganese, but it requires several redistillations before it can be obtained in the pure state, for which reason it is at present a very expensive compound.

When methylal is quite pure it is almost tasteless, but bites the tongue, and, owing to its low boiling-point, quickly evaporates. The odor of it is fragrant, and not very powerful. The pure vapor creates no irritation on being breathed.

After long exposure to the vapor of methylal, in an atmosphere containing not less than thirty-five per cent. of the vapor, warm-blooded animals may be made to pass into a sleep which, once established, is deep and prolonged.

Methylal was first introduced by Dr. B. W. Richardson, who in his early researches supposed that he had found that it was a marked narcotic, but he now states (*The Pharmaceutical Journal and Transactions*, February 19, 1887) that he believes that the narcotism so produced was due to the presence of acetone from the methylal not having been sufficiently pure. Recently, with a perfectly pure specimen, he endeavored to anæsthetize two dogs with methylal in order to enable them to be operated on painlessly. After half an hour's inhalation of the vapor narcotism was not produced. The fluid was then injected hypodermically in one animal and to the extent of an ounce dose, upon which a gentle sleep or rather intoxication followed, but with no sufficient anæsthesia to allow painless operating.

In action as a medicine, methylal lies between alcohol and anhydrous ether. It quickens the action of the heart with reduction of arterial pressure; it makes the respirations slow and deep; it induces a tendency to sleep; and it is a sedative to pain, but not to a very deep degree. On the whole, it would be best to keep it in the group of anodyne antispasmodics, in which Dr. Richardson originally put it. It causes very little muscular excitement and no vomiting, but after long inhalation of its vapor it produces a free flow of saliva. As it mixes well with alcohol and with ether it might be administered with either of these agents, and it might also be given with amyl nitrite for the relief of colic, asthma, angina pectoris, or tetanus; but before it can come into general use it must be reduced in price.

Methylal is very soluble in water, and may be administered by the mouth when diluted with water or by hypodermic injection. Dr. Richardson recommends commencing with a dose of a fluidrachm, mixed either with glycerin or syrup of orange-flowers and distilled water.

THE SIGNIFICANCE OF URIC ACID DEPOSITS IN URINE.

Dr. Johannes Mygge, while chief of Professor Trier's clinic in Copenhagen, having repeatedly remarked abundant and persistent deposits of uric acid coinciding or alternating with albuminuria, carried out a series of examinations on the urine of the 272 male patients under his supervision. Of 3287 urines examined, 2786 from 127 patients were entirely free from uric acid deposits, while they were found in 501 specimens from 105 patients, but only in any considerable quantity in 262 specimens from 59 patients. In 43 of these last patients the deposits were of a transitory character,—that is, they were only observed once or twice; while in the remaining 16 they were found to persist for a week or more. Deposits, both of a transient and of a permanent character, were found, especially in rheumatic affections, whether of an acute or chronic form. Transient deposits were found also in pneumonia in 11 cases out of 25. In 27 out of the 59 patients in which uric acid deposits were observed albuminuria was also present in appreciable quantity, and in many of the rest there was a doubtful trace noted. Dr. Mygge's observations confirm Dr. Dickinson's statement that deposits of uric acid of a transitory character frequently coincide with the suppression of acute albuminuria. In the majority of cases where the deposit was examined microscopically, casts or tubal epithelium cells were found, indicating that some connection probably exists between uric acid deposits and functional renal disorder. In some instances, it may be supposed that a peculiar condition of urine, especially its supersaturation by uric acid or an increase in its acidity, has irritated the epithelium of the tubes, and has thus set up a renal lesion.

In others, the latter condition doubtless precedes the precipitation of uric acid, and here Esbach's theory of the precipitation of uric acid being due to the existence of morphological elements in the urine may afford an explanation.—*The Lancet*, February 12, 1887.

ARBUTIN.

Uva ursi leaves contain, in addition to tannic and gallic acids, a bitter glucoside, arbutin, already several times referred to in the GAZETTE, which is white, crystalline, and soluble in water. During the past four years several observers have tried to determine whether arbutin might not, with advantage, be substituted for the various preparations of uva ursi now in use. Lewin, in 1883 (*Virchow's Archiv*, xcii. p. 517), showed that arbutin splits up, when boiled with dilute sulphuric acid, into hydrochinon, methyl hydrochinon, and sugar, and stated that when administered it is in part decomposed, so that the urine contains besides arbutin a certain amount of hydrochinon. Now, hydrochinon is itself an antiseptic and antipyretic, and has been found useful by Brieger as an injection in gonorrhœa. Lewin recommended the substitution of arbutin, in 15-grain doses, for the ordinary preparations of uva ursi. Uva ursi is a reputed diuretic as well as a specific in vesical catarrh. Menche published a paper in 1883 (*Cent. f. Kl. Med.*, xxvii. p. 443) on arbutin as a diuretic, and recorded some cases which served to illustrate its value in cardiac dropsy. Subsequent observations have not confirmed Menche's views on this point. In a few cases of cardiac dropsy, in which the drug was given at the Manchester Infirmary, it proved wholly inefficacious as a diuretic.

Paschkis (*Wien. Med. Presse*, 1884, No. 13) obtained no good results from the use of arbutin in several cases of cystitis and gonorrhœa, though he found these ailments markedly improved by uva ursi itself. Either arbutin is not the active curative principle, at least in the doses employed by Paschkis (30 grains daily), or the preparation he used was not arbutin.

Schmiz (*Cent. f. Kl. Med.*, No. 49, 1884) found arbutin very useful in some cases of bladder catarrh. He did not see good results follow its use in all cases, but recommends its use in preference to uva ursi itself. Very recently Kunkel (*Münch. Med. Woch.*, December 7, 1886) published his investigations upon the absorption and excretion of arbutin, and has arrived at the conclusion that the greater part is excreted unchanged; a little is decomposed in the intestine, but it is not decomposed, as Menche thought, in its passage through the system. At the present time, then, the value of arbutin must be regarded as doubtful, and though it may be tried in doses of 10 grains, where ordinary remedies have failed to relieve bladder catarrh, it cannot be used as a reliable remedy. Moreover, its price (about thirty-six cents a drachm) prevents its extensive use.—*Medical Chronicle*, March, 1887.

ANTIPYRETIC ACTION OF NITROGENIZED AIR.

DR. FRANCISCO VALENZUELA, of Madrid, has made some observations (published in *El Siglo Mèdico*, January 30, 1887) on the effect of inhalations of nitrogen, or rather of air containing an abnormally large proportion of nitrogen, upon febrile diseases. He compared its action in reducing temperature with that of cold applications, quinine, antipyrin, digitalis, and arsenic, and concludes that the inhalation of nitrogen is the only method of treatment the cessation of which for a day is not followed by a rise of temperature to its former height. It has also, he believes, a beneficial effect on the diseased process itself. The plan adopted was to administer the nitrogen in two daily sittings of from half an hour to an hour in duration, beginning with air containing 17.76 per cent. of oxygen, and gradually decreasing this proportion till at the close of the sitting it was reduced to twelve per cent. Some few details are given of a phthisical case in which it was tried. At first some dyspnœa was produced, but the evening temperature at once sank to normal, in addition to which the cough decreased, the blood almost entirely disappeared from the sputum, the sweats became less frequent, and the appetite improved. This patient had been previously treated by quinine, with but little good result. No other cases are reported, though several other patients were treated in this manner, most of whom are stated to have been benefited by it.—*The Lancet*, February 12, 1887.

Reviews.

ON DISORDERS OF DIGESTION; THEIR CONSEQUENCES AND TREATMENT. By T. Lauder Brunton, M.D., D.Sc., F.R.S.

London and New York: Macmillan & Co., 1886.

This is a volume of nearly four hundred pages; the first eighty of which are occupied

with the Lettsomian Lectures, three in number, whose subject is the discussion of imperfect digestion, its results and its treatment. The rest of the work is a reprint of twenty-one papers, which have been previously published, most of them in the London *Practitioner*. No doubt the readers of the THERAPEUTIC GAZETTE have become acquainted with the various highly suggestive original articles written by Dr. Lauder Brunton as fast as they have been published, and we shall not occupy space with their discussion, but merely indicate the various subjects. These are Action of Mercury on the Liver—Physiological Researches on the Nature of Cholera—On the Action of Purgative Medicines—Atropine as an Antidote to Poisonous Mushrooms—Physiology of Vomiting and the Action of Anti-Emetics and Emetics—The Physiological Action of Alcohol—On the Action of Alteratives—Symptoms, Pathology, and the Treatment of Albuminuria—Arsenic in Albuminuria—On Dyspepsia—On the Use and Administration of Fats—On the Action of Tonics—Headache and Neuralgia and other Diseases connected with the Teeth—Indigestion as a Cause of Nervous Depression—Introductory Remarks on the Structure and Function of the Kidney—How to make a Poultice—On the Pathology of Dropsy—Pathology and Treatment of Headache—On the Action and Use of Diuretics—On Poisons formed from Food, and their Relation to Biliousness and Diarrhœa.

The Lettsomian Lectures have all the individuality that so plainly marks the work of Dr. Brunton, showing in extraordinary abundance curious out-of-the-way knowledge combined with a peculiarly brilliant suggestiveness and much literary skill. How a good dinner converted the doctor from an enemy of the London "City Companies" to a strong friend is well told on page 19, and shows clearly why these companies are enabled to spend so much money in riotous living and defy the efforts of the Parliamentary committee: for what Parliamentarian could withstand the seducing influence of a dinner whose æsthetic perfection is only comparable with the rare beauty that overspreads the canvas of a Raphael?

Every practitioner of medicine should carefully read these papers of Dr. Brunton at least once, or, if needs be, buy the book for such purpose. We cannot, of course, give the full argument, much less even shadow forth the details, which are, after all, the most valuable portions of the book. For the purpose, however, of affording a peep into this treasure-mine, we call attention to the way in which it is shown that the object of digestion is to break up the large molecules of beefsteak and bread into the small ones of peptone and maltose, so that they may readily pass through the atomic sieves, which are known as mucous membranes. Whilst within the liver the process is reversed, and the small molecules of peptone and maltose, which have been absorbed, are reconverted into the larger molecules of albumen, which are fit food for living tissues. Again, it is revealed that whilst most people are fully aware of the dangers of sewer-gas, comparatively few recognize the perils in which they daily live from the poisonous substances formed in their own intestines as the result of imperfect digestion. As is shown by a case reported by Senator in 1868, even enough sulphuretted hydrogen may be generated in a man's own abdomen to cause a fatal relapse. The researches of Ludwig, Schmidt-Mühlheim, Bocci and Brieger, and others are discussed by Dr. Brunton, as showing that alkaloids and other poisonous principles formed in the alimentary canal are capable of producing profound nervous depression or other serious poisoning, a fact which our readers will remember was abundantly confirmed in the Memoir published in this journal some months since, concerning the effect of pepsin peptones injected into the blood.

NERVOUS DISEASES AND THEIR DIAGNOSIS. A TREATISE UPON THE PHENOMENA PRODUCED BY DISEASES OF THE NERVOUS SYSTEM, WITH ESPECIAL REFERENCE TO THE RECOGNITION OF THEIR CAUSES. By H. C. Wood, M.D., LL.D.

Philadelphia: J. B. Lippincott Company, 1887.

In his "Introduction" the author states, " . . . In the course of years I have gradually adopted a method of instructing students which has seemed to me more in accord with the every-day needs of the medical practitioner, and more apt to lead to a practical understanding of disease of the nervous system than is that adopted in the ordinary treatises upon the subject. When a case offers itself for examination the physician must needs travel from the symptoms back to the lesion, and not from the lesion to the symptoms. He does not say, This man has a clot in the brain, therefore he has hemiplegia; but he begins with the paralysis, and passes from it by the process of induction to the lesion. Hitherto the authors of text-books have travelled from the lesion to the symptoms. The present treatise is an attempt to follow the route which the practitioner must

pass over daily." In this statement rests not only a more than sufficient reason for placing another book before the profession, but also the general plan of the work, a new departure in medical literature which will find admirers wherever the book is read, and should claim numerous disciples among those who would enlighten the profession in medical matters, especially those connected with a specialty. Too frequently the writings of the specialist mystify rather than elucidate, and serve to impress the medical public with the complexity of such maladies, which only the special skill of the writer, or one of his ilk, can hope to unravel. Not so with the work before us. The exigencies of clinical teaching through a course of years have developed an appreciation of the needs of the student, together with an unusual aptitude for clear and impressive statement.

Chapter i., of seventy-three pages, is devoted to "Paralyses." The various forms of palsies are carefully classified, concisely defined, and, wherever possible, succinctly differentiated. All palsies are divided into *functional* and *organic*, and the latter further divided into six classes, including general palsy, hemiplegia, paraplegia, monoplegia, multiple palsies, and local palsy. Interesting cases of unique or strikingly typical character are interspersed here and elsewhere throughout the work.

Chapter ii., on "Motor Excitements," represents eighty-three pages. Disturbances of motility are divided, for convenience of clinical study, into convulsions, spasms, choreic movements, tremors, automatic movements, and contractions. These symptoms are defined, and the various diseases, of which one or other of them furnish characteristic symptoms, are considered and differentiated. Convulsions are divided into hysteroidal, epileptiform, and tetanic. Epileptiform convulsions are ascribed to idiopathic epilepsy, peripheral irritations, cardiac failure, organic disease of the brain, toxæmia, uræmia, and hysteria. Tetanic convulsions to hysteria, tetanus, poisoning, tetany. The other divisions of the subject are given due attention. The sections on epilepsy, tetanus, and chorea are exceptionally fresh and satisfactory.

Chapter iii., "Reflexes," covers thirteen pages, in which the various expressions of this interesting phenomenon are portrayed.

Chapter iv. deals with the "Disturbances of Equilibration," including disturbances of co-ordination, cerebellar titubation, and vertigo.

In chapter v. "Trophic Lesions" are dealt with in a masterly manner, inducing many who read it to look deeper than the surface for many superficial destructive lesions.

"Sensory Paralysis" in chapter vi., "Sensory Exaltations" in chapter vii., and "Disturbances of Special Senses" in chapter viii., will prove of great interest to the general practitioner, meeting, as he does, so constantly symptoms referable to these classes, which are with difficulty traced to their true source, or given their proper interpretation, until too late to materially benefit the sufferer.

The next two chapters deal with "Disorders of Memory and Consciousness." In the last chapter "Disorders of Intellection" are classified and concisely described. Here, as throughout the work, the characteristics of the author are prominent. Order is brought out of chaos, the mazy fog which gathers about nervous diseases is dispersed; simplicity supplants complexity. Whatever may be the verdict of the specialist, whose mental vision has become adjusted to the aforesaid fog, certainly the general practitioner and the medical student will acknowledge their deep indebtedness to the author for his simplicity, conciseness, absence of ambiguity, and, above all, for the unique idea of tracing a symptom to its source, and enabling all who meet with such stumbling-blocks to properly interpret their significance. Throughout the work gives evidence of the profound student, the alert clinician, and the impressive, thoughtful teacher. The first might have dived to even greater depths than the book makes claim, the second might reach as accurate conclusions in his own inner consciousness, but only the latter, through years of careful effort, could have elucidated the subject so satisfactorily. The interest of the book never flags nor tires; its statements are fresh and crisp.

J. B. WALKER.

THE CURABILITY OF INSANITY: A SERIES OF STUDIES. By Pliny Earle, A.M., M.D.
Philadelphia: J. B. Lippincott Company, 1887.

This book is composed of eight studies on the subject of the Curability of Insanity, the first of which was written in 1876, the last in 1885. The cause of the writing of the first essay, and therefore of the whole book, was evidently the apparent inferiority in the results obtained by Dr. Earle in the institutions under his care to those achieved in certain other asylums. The essay written in 1876 clearly established the fact that the statistics

given by the various asylums of America were worse than useless, and were so misleading and unfair as that they might well be stigmatized as falsifications. One great source of fallacy was that cases of insanity would be reported over and over again as cured, the cures being merely the development of successive remissions. Thus, in the Friends' Asylum at Frankford, eighty-seven *persons* contributed two hundred and seventy-four recoveries to the statistics of the institution, whilst a close analysis shows that not more than two actual permanent recoveries occurred. A champion cure-maker was afforded in a patient in the Pennsylvania Hospital for the Insane, who was successful in furnishing in his own person thirty-two cures! An analysis of the reports of the State Hospital at Worcester, Mass., showed that seven persons furnished ninety-two recoveries, and "yet two of these persons finally died insane in the hospital, and the third is now an inmate of it, considered hopelessly insane." Of the ninety-two reported recoveries only four were permanent.

Both space and inclination are wanting to follow further the analysis of various asylum reports made by Dr. Earle. The statistics of the asylums were rendered still more favorable not only by confounding persons and cases, but also by a juggling which is little less than criminal. If ten cases originated in a year and seven recovered, these seven were reported as cures of recent cases, while the other three were put into the list of cases sick for more than a year,—*i.e.*, of cases not recent. In this way it was apparently proven in some asylum reports that from ninety to one hundred per cent. of recent cases got well, and justification was obtained for the assertions of Dr. William H. Stokes, of the Mount Hope Institution at Baltimore, Md., that "not merely *nine* out of ten cases of insanity, of a less duration than one year, may be cured, but that *ninety-nine* in a hundred can be radically restored, unless there exists in the individual a strong constitutional tendency to mental disease, or unless circumstances beyond our control, and the injurious tendency of which has been fully explained, intervene to interrupt and disturb the process of cure."

The eighth study of Dr. Earle, written in 1885, is interesting as giving the latest and most reliable data which we have in regard to the curability of insanity. The most reliable previous collocation of cases was that made by Dr. T. A. Chapman, of the Hereford Asylum of England, in which, out of ninety-three thousand four hundred and forty-three cases of insanity occurring between 1872 and 1882, the percentage of the whole number of recoveries is thirty-eight, or, if recent cases are alone considered, forty-two and one-half. The statistics of twenty-three British asylums, collocated by Dr. Earle himself, give the proportionate recoveries in all cases forty-four per cent., in recent cases fifty-five per cent. In thirty American hospitals whose statistics have been examined and collocated by Dr. Earle himself, the proportion of recoveries, as compared with admissions, is twenty-nine per cent.; of recent cases, fifty-four per cent.

We cannot further follow the statistics discussed by Dr. Earle. As far as they go they seem to us that the recoveries in the British asylums exceed those in the American institutions by between eight and nine per cent. An important conclusion reached by Dr. Earle is that the per cent. of the reported recoveries in all cases received at the hospitals in this country still continues to diminish. Various causes may be assigned for this, but, to our thinking, *the one* real cause is the increased honesty and care in the making of the statistics. In bringing this about the writings of Dr. Earle have played a very important part, and we are glad that permanent form has been given to work which otherwise might have been buried in the mountains of chaff which largely make up the ever-increasing mountain ranges of American medical periodical literature.

THE PRINCIPLES OF PHARMACOGNOSY. By Friedrich A. Fluckiger, Ph.D., M.D., Professor in the University of Strasburg, and Alexander Tschirch, Ph.D. Translated by Frederick B. Power, Ph.D.
New York: Wm. Wood & Co., 1887.

According to the authors of the work before us, the use and primary object of pharmacognosy is the study of botany, zoology, and pharmacy of medicinal agents, and the arrangement of the material in a scientific form by an appropriate and comprehensive representation, so as to subject it to a closer examination. The term pharmacology they restrict to the science which treats of the therapeutic action of medicinal agents. In most of our English works pharmacology is considered as comprehending the study of everything that relates to medicines. In treating pharmacognosy the authors consider the following points as prominent: first, naming the plant; second, the geographical distribution; third, cultivation; fourth, col-

lection and appropriation; fifth, commercial relations; sixth, description; seventh, morphological characters; eighth, microscopic structure; ninth, chemical constituents; tenth, substitution and adulterations; eleventh, history; twelfth, pharmacognostical systems. The great bulk of the work, namely, from page 55 to page 279, is chiefly a study of the anatomy of plants. It is very fully illustrated with nearly two hundred figures, which are well drawn and characteristic, and of great value to those students of pharmacy who desire to precede their study of the individual drugs by a thorough education in the anatomy of plants, and especially of those portions of the plants which contain medicinal agents.

To the physician this book does not appeal very strongly. The professions of pharmacy and medicine are more and more divorced as progress increases in each branch the extent of the field to be covered by its students. The modern and growing method of preparing medicinal agents on an immense scale, and furnishing them to the practitioner and to the druggist all ready for exhibition, bids fair to choke out even the scientific pharmacist, and to make the druggist merely a commercial distributing channel, through which pour the rills from the great lake. If this continues, the modern pharmacist must become more and more commercial in his tone and life, whilst a few highly-cultivated scientific specialists find employment in the great manufacturing houses.

Correspondence.

LONDON.

(From our Special Correspondent.)

Since my last letter to you an event has occurred in our pharmacological world which gives us the liveliest satisfaction, and which I am sure will awaken similar sentiments in yourselves when its significance is fully appreciated. I refer to the appointment of Dr. Cash to the important chair of Materia Medica in the University of Aberdeen. Your readers have doubtless heard of the distressing death of Dr. Davidson, the late professor,—how he fell down apoplectic in the presence of his students, a victim of constitutional gout, against which he had struggled manfully and patiently for many years. To worthily fill the post left vacant by such a man was no easy task. But beyond the question of mere ability, it was felt by those who have the advancement of scientific pharmacology in this country at heart, that the present opportunity was not to be lost of planting a centre in the far north which should extend a knowledge of the newer methods and the more exact results of therapeutical research to the farthest extremity of the kingdom. Dr. Cash is known throughout the world of medicine by the many valuable contributions which he has made to physiology and pharmacology, in connection especially with his old master Ludwig, and more recently with his friend Dr. Lauder Brunton, whom he has assisted for several years. His candidature was therefore warmly supported by many of our leading men; yet for a time the issue was doubtful, a disturbing rumor being raised that a distinguished Aberdeen surgeon was to succeed to the vacant chair by a kind of local right. Nothing could possibly be more undesirable than that the work of a great department such as this should be allowed to degenerate into a series of dry lectures on the materia medica, with a compilation of the latest therapeutical applications of drugs arranged on a purely empirical basis. This is the kind of course which was generally accepted in our country until within the last few years. The government, which in the present instance possessed the patronage of the chair, is to be congratulated on its choice, and the northern university on the latest addition to their professorial staff.

It occurs to me, in connection with this event, that your readers may be pleased to learn something about our ancient Scottish universities. I say "learn," for I cannot expect that the profession in the States can possibly be generally conversant with institutions which are but imperfectly known and understood even in England. Whilst in London we have now no fewer than twelve schools of medicine, all perfectly self-supporting and independent of the state, and whilst our only university was founded but fifty years ago, and is nothing more than a complicated examining machine without professors or pupils, Scotland possesses four universities subsidized by the nation, of venerable age, the centres of the greatest literary and scientific activity. Edinburgh and Glasgow, St. Andrew's and Aberdeen, are universities in the proper sense of the word,—universities founded originally on Italian and French models, but now approximating more closely in many respects to the German type, with which many of your readers are personally familiar. The professors are chosen from the most distinguished

men of the three kingdoms. They enjoy an income, from salary and fees, which is always ample, and in many instances very handsome, —at Edinburgh, for example, several of the medical chairs are worth over two thousand pounds a year. The general control of the universities is vested in a small court, on which are representatives of the graduates, the crown, and the students respectively. The graduates hold a council or convocation on fixed and special occasions, and publicly discuss the affairs of their alma mater. The executive body is practically the senate, which is composed of the professors and principal, and which exercises full control over the students not only in college but out of college. I need hardly add that the many advantages of university life are fully enjoyed by Scotch students, who display all the traditional independence, the sense of self-importance, and the antagonism to "the town," which appear to be essential features of the undergraduate in every country. In surroundings such as these, and with an assured competence, Scottish professors are free to devote their whole time and energies to their special work, —to the discovery, that is, and the exposition of the truth. Those members of the medical faculty who desire hospital and consulting practice may usually secure it by their talents and general claims, and can carry it on without that harassing waste of time and energy, that incessant worry, of which I hear so much complaint from our busier men in London. These remarks apply particularly to the University of Aberdeen, where you may confidently look for much good work from the new pharmacological department. The place is filled with traditions of honest labor and learning. Founded in 1494, in the reign of James IV. of Scotland (strange to think, at the very time of the voyages of Columbus!), the University of Aberdeen has produced such men as the Gregorys, Beattie the poet, Reid the philosopher, many mathematicians and physicists of the first rank, and some of the foremost men of science of the present day.

Another very satisfactory sign of the spread of the newer therapeutics is the character of the books that have recently been placed in our hands and in the hands of students by recognized authorities on this subject. Prominent among these is the great work by Dr. Lauder Brunton, which, I am glad to see, has already reached a third edition. This book is as well known with you as it is with us, having been adapted to your Pharmacopœia by Dr. Williams. Your readers will learn with some amusement that Dr. Brunton has been charged with borrowing from the homœopathists in the compilation of his therapeutical index. Ingenious and persistent efforts have been made to drag him into a public controversy on this subject in the columns of the medical journals,—into a controversy, of course, of that endless, useless kind of which we have all been heartily sick as often as the different therapeutic schools have assailed one another. In the present instance the gauntlet has been thrown down by a highly respectable homœopathic practitioner in town of the name of Dr. Dudgeon, who enjoyed no doubt the opportunity which his challenge afforded him, of standing forth as the champion of truth and reason. With characteristic Scottish caution, and with the tacit approval of all who have had experience in such matters, Dr. Brunton has denied himself the pleasure of public combat. However, on being again assailed in the *Lancet*, he has replied that he will join issue with his opponent,—not in the pages of the medical press, but in the preface to the new edition of his book. We do not expect to find the promised discussion the most profitable portion of the new volume, for, as I have just said, controversies of this kind are usually utterly barren of good results; but for all that we shall turn to it with interest, not to say amusement, as a little incident in the history of therapeutics.

A very important question has lately arisen in this country in connection with our Pharmacopœia, namely, whether the preparations contained in it are strictly official. A public analyst in Sheffield discovered that some samples of tincture of opium that he had caused to be purchased in the town contained a very insufficient amount both of opium and of spirit. When the case was brought before the magistrate it was dismissed, the worthy justice being of opinion that "tincture of opium" means *any* tincture of opium; that the chemist may dispense any compound of opium and spirit he pleases under this name; that there is no law to compel a pharmacist to follow the British Pharmacopœia formula. This is a startling finding for us, who have always believed that "official" remedies are the only compounds that may be sold *under the official titles;* and I need hardly say that it has caused a flutter not only among the pharmacists but in the profession. If there be no better definition of tincture of opium, as sold in this country, than *any* tincture made from opium, there is an end of prescribing. However, we have good reason to believe that the Sheffield

magistrate gave judgment on insufficient information. It appears that although the Medical Act which directs that the first British Pharmacopœia should be compiled did not explicitly command it to be followed, it distinctly confirmed all previous Acts and Orders in Council relating to the London, Edinburgh, and Dublin Pharmacopœias, and that one of these orders expressly charges "all apothecaries and others whose business it is to compound medicines . . . within Her Majesty's kingdom . . . that they do not compound or make any medicine or medicinal receipt or prescription, or distil any oil or waters, or make other extracts that are or shall be in the Pharmacopœia, . . . in any other manner or form than is or shall be directed, prescribed, and set down by the said book."

The discussion of this subject has naturally raised the question of the meaning and value of a "national" Pharmacopœia. We understand that in the States your Pharmacopœia is not the production and property of the nation; that it is only a convenient compilation of formulæ for preparing drugs which your pharmacists may or may not follow. I may be wrong in this interpretation; but if I am right, do you not run a constant risk of obtaining improper substitutes for officinal preparations at the hands of unscrupulous druggists?

Another question in connection with our British Pharmacopœia which has recently been exercising us, is the best method of keeping it up to date. So rapid is the advance of pharmacology nowadays that the Pharmacopœia speedily becomes obsolete. The last British Pharmacopœia (1867) was almost useless for this reason before the appearance of its successor in 1885, and even this "new" Pharmacopœia, as we still call it, already begins to fall behind the times in a similar fashion. Our Pharmacopœia is published by the General Medical Council, a body composed of representatives of all the licensing medical authorities in the three kingdoms (including, of course, the universities), of the practitioners of medicine and of the crown. This council has entire control of medical education and legislation in this country, and one of its committees compiles our national codex. I have been favored with a copy of the report of this committee, presented to the council at its winter session a few days ago; and I find in it a valuable recommendation as to the plan to be adopted for keeping the Pharmacopœia up to date. This scheme has been framed by Professor Attfield, whose fame as a chemist is as great with you as with ourselves, and whose services have most wisely been retained as reporter by the council after the completion of the present British Pharmacopœia, the production of which was in a great measure his work. Dr. Attfield submits to the council a collection of abstracts of all published criticisms of the British Pharmacopœia and technical suggestions, as well as notes of all original investigations, that seemed likely in any way to aid in the production of a future Pharmacopœia. He recommends that these and similar abstracts and notes in the future be printed (for official use only) and submitted to the standing committee, which will thus steadily acquire the materials for the production of a new codex, or for the correction of the present codex, as circumstances may demand. Already, Dr. Attfield adds, since the current Pharmacopœia was issued, there have been published some valuable improvements of official processes,—improvements which may deserve incorporation. Prominent among these improvements are methods for securing constant strength in powerful remedies, hitherto liable to vary considerably in strength. The processes that provide for fairly constant strength in the preparations of cinchona, nux vomica, and opium appear likely to be extended to preparations of belladonna, ipecacuanha, and some other potent drugs. A dispensing difficulty, however, has arisen in connection with the semi-solid "standardized" extracts of such drugs. Inasmuch as the non-alkaloidal soluble material in nux vomica seeds, *e.g.*, varies greatly in different parcels, it follows that an extract evaporated to the proper alkaloidal strength, while occasionally of fit pilular consistence, will sometimes be almost fluid. Such a difficulty can be surmounted by adding some solid neutral substance, such as milk sugar, to the soft extract to bring it to the desired pilular firmness. British pharmacists, however, bearing in mind the action of the Food and Drug Acts, hesitate to add foreign substances to their drugs without official sanction. Custom, however, sanctions the employment of excipients by the pharmacist at his discretion, and he doubtless will sooner or later find modes of adjusting the advantage of constancy in strength of powerful drugs with inconvenience in dispensing such "standardized" drugs. I may remark with respect to the variable consistence of standardized extracts, referred to by Dr. Attfield, that custom is changing here in the manner of *pre-*

scribing pills. Few of us now seriously attempt to express our familiarity with the consistence of an extract. We very commonly order the quantities which we desire of the important ingredients, and complete the prescription with "*in formâ pilulæ*," leaving the intelligent pharmaceutist (and all our pharmaceutists are now required by law to be intelligent in such matters) to find the most suitable excipient for himself.

BERLIN.

(From our Special Correspondent.)

The medical world of Germany is suffering from a loss, which is almost irreparable, in the death of Carl Schrœder, who died on February 7, after a brief illness, of cerebral abscess. He was the most celebrated German gynæcologist of the present time. Schrœder had attained world-wide reputation through his two books, which marked epochs in medicine, his "Text-Book on Obstetrics, including the Pathology of Pregnancy and the Puerperal State," and his "Handbook of Diseases of the Sexual Organs of Women." He was only thirty-eight years old when, in 1876, he was chosen to succeed E. Martin as regular professor of the Lying-in and Gynæcological Clinic, and went to Berlin. One of his most remarkable achievements was the erection and remodelling of the clinic building, which is regarded as the best of its kind by the physicians and students of the nation.

Schrœder was only permitted to enjoy a little more than four years' usefulness in this institution when he died at the age of forty-nine, in the height of his scientific activity. His latest work, published last year, "The Pregnant and Parturient Uterus," proves how much we could have expected from him.

Foreigners, especially Americans, many of whom are numbered among his students, will join us in regretting his loss.

From the 13th to the 16th of April will be held the sixteenth congress of the German Surgical Association, under the presidency of R. von Volkmann, and about the same time the Sixth Congress for Internal Medicine will be held in Wiesbaden, with Leyden as president: the latter congress has already announced its programme. One day's consideration will be given to the "Therapy of Phthisis," the "Localization of Cerebral Diseases," and the "Pathology and Therapy of Pertussis."

The first subject will be of especial interest, as giving the views of this great association, which numbers among its members many of the greatest living authorities with regard to the many recently recommended methods of treatment in phthisis; and the physicians discussing the question will endeavor to bring the therapy of this disease into accord with their own experience and best knowledge.

We shall report this congress for the readers of the GAZETTE.

A new periodical has recently appeared in Berlin, under the editorship of Professor Liebreich, called the *Therapeutic Monthly*. Its purpose and scope are similar to that of the THERAPEUTIC GAZETTE in America, the *Practitioner* in England, and the *Bulletin de Thérapeutique* of France, and to form a repository for matters of interest regarding therapeutic questions. Up to the present time there has been no such organ, although there is an abundance of valuable journals in Berlin.

We mentioned in our former letter the results obtained by Harrlich in Leyden's clinic in the treatment of joint-rheumatism. At a later meeting of the Society for Internal Medicine the same observer continued his remarks, and discussed the effects of salol in the treatment of acute infectious diseases, especially typhoid fever. He came to the conclusion that, although the remedy proposed accomplished as much as was claimed for the carbolic acid treatment of typhoid, it had developed no specific power in infectious diseases, and especially in typhoid. It cannot shorten the disease nor cut short the process of infection, as quinine acts in malaria. The satisfactory use of salol in typhoid is limited to its effect upon the symptoms only; as an antiseptic, in common with others, it may be valuable to reduce temperature. In a number of severe cases, which have been under observation for some time, when pure salicylic acid had been given, salol was not found to be excreted; the possibility of the combination of salicylic with carbolic acid in the organism is to be considered.

Guttmann, of the "Moabit" hospital, has reached the same conclusions after treating seventeen cases of acute joint-rheumatism and several cases of typhoid.

Frænkel has given us a new indication for the use of massage in a lecture delivered before the Society for Internal Medicine upon weakness in vocalization. The six cases on which he based his theory were four singers, a clergyman, and a teacher. All of the cases showed marked inability to use the voice at

certain times when attempting to sing, to accent in a loud voice, and to emphasize a pathetic passage in an address. This aphonia, however, could be overcome by a strong volition. Laryngoscopic examination gave a negative result. Simulation and hysterical paralysis were excluded. Following the analogy of the name mogigraphia for writer's cramp, Frænkel has named this affection mogiphonia. In the last case described by this writer the following treatment was pursued: the throat of the singer was well rubbed with lanolin, and both sides simultaneously, beginning at the angle of the jaw and extending downward. At the anterior border of the sterno-cleido-mastoid muscles the fingers on each side pressed the larynx as closely as possible without pain. This massage was repeated daily at sittings at which fifty frictions over the larynx were made, and the hand was also carried across the throat at the os hyoides. After a very few days a marked improvement was noticed, and in six weeks the patient was able to sing for more than half an hour. Frænkel urges the adoption of his method in similar cases.

Langenbeck, director of the Lazarus Hospital, reports in the Berlin Medical Association the following interesting experiences in cholecystotomy and cholecystectomy. In cases which have resisted internal treatment, and where surgical treatment seems indicated, he prefers extirpation of the gall-bladder to all other procedures. He has already operated upon twelve cases, of whom only two have died from complications; the others recovered, and of these it is known that several have enjoyed good health for four or five years. In chronic obstruction of the gall-duct Langenbeck operated three times; in one case he failed to render the duct patulous; in two others he evacuated the abscess, which had formed at the obstruction, removing pus mixed with bile; one of these cases he showed to the society. In this case an exploratory incision found the gall-bladder very much contracted, and cholecystotomy was determined upon. On opening the gall-bladder there was a discharge of thick greenish-gray pus. The patient recovered rapidly. In two or three weeks the discharge from the gall-bladder ceased; bile was present in considerable amount in the intestines, the fæces were dark brown in color, and the stools occurred regularly.

After six or seven weeks the fistula which had been formed closed entirely. In the other similar cases the fistulæ have not entirely closed, a very fine opening remaining, from which a little bile is at times discharged. In the same society, on February 9, Professor Küster, director of the Surgical Department of the Augusta Hospital, demonstrated one of the very rare cases of originally diagnosed pancreatic cysts.

Up to the present time there have been but eleven cases of cysts of the pancreas operated upon, and of these nine were incorrectly diagnosed. The correct diagnoses were those of Gussenbauer, of Prague, and Senn, of Chicago, and these diagnoses were those of a high degree of probability only.

The case demonstrated was that of a strong man, 46 years old, who had suffered very little ill health, but who had eight years previous sustained a severe contusion of the back from a fall. In the summer of 1885 he was frequently attacked by cardialgia, which, in December of that year, became so severe that he sought medical treatment. About the end of February, 1886, a tumor in the epigastrium was discovered. On the 15th of July, 1886, he came to Prof. Küster for treatment with the diagnosis of echinococcus of the liver. On careful examination it was seen that the tumor fluctuated and showed distinct pulsation. Percussion proved that it was not attached to the liver. Exploratory puncture revealed a dirty yellow-colored liquid containing much albumen. Examination with the microscope showed a large number of red blood-corpuscles. All of these signs led Küster to diagnose a pancreatic cyst. He reached this conclusion from the position of the tumor, and by excluding the following conditions: aneurism of the abdominal aorta and its branches; cysts of the suprarenal capsules; echinococcus of the liver and spleen; enlarged lymphatics; ovarian cysts were excluded by the patient's sex; malignant, small tumors in this region; after careful study of these conditions, it was thought to be correctly diagnosed as a pancreatic cyst, and an operation deemed advisable. On July 20 the abdomen was opened by an incision which extended from the tip of the sternum to a point one and one-quarter inches below the umbilicus. A large cyst at once presented, its upper extremity covered by the stomach, its lower extremity by the transverse colon. The ligamentum gastro-colicum was adherent to the cyst; the latter was partially detached and cut across, and its flaps sewed to the abdominal wall. The cyst proper, thus separated from its adhesion, was punctured and emptied of two and one-half quarts of liquid.

It was then incised transversely, and sewed for a second time to the wall of the abdomen; its cavity was cleansed and tamponed with iodoform gauze, and the incision almost closed.

On August 18 the wound was entirely closed, except a very small fistula, which was also healed by September 2. The patient had suffered no inconvenience, and had gained forty pounds in weight. Up to the present time there are three methods of operating for cysts of the pancreas,—simple puncture and evacuation, extirpation, and incision and sewing the sac to the abdominal wall. Küster decides without question in favor of the third method. Of the five cases of extirpation four died; in contrast is the result of the six cases where incision and suturing were done. All recovered, and five made speedy recoveries to comfortable health; in only one a small fistula persisted.

February 21, 1887.

PARIS.

(From our Special Correspondent.)

The study of alkaloids and active principles is always of some importance, as they most likely represent the materia medica of the future. For this reason all recent experiments, chemical or physiological, respecting the older or the comparatively new alkaloids, or active principles, are generally deserving of notice.

The latest to receive the attention of French investigators are digitaline, hyoscine, and ulexine. *Digitaline* is certainly not a new-comer. The trouble is there are several substances known as digitaline, some of German make, others of French manufacture, and none seem to be exactly alike. In fact, there are too many digitalines. M. Lafon, in a paper which was this year awarded the Buignet prize by the Academy of Medicine, has again attempted the solution of a difficult and much vexed question, which he had already investigated. Although it cannot be said he has entirely succeeded, the results arrived at are worth recording. Briefly stated they are as follows: To begin with the chemical properties, M. Lafon has found a new color reaction of digitaline. When the substance in question is moistened with a small quantity of sulphuric acid, mixed with an equal weight of alcohol, on gently heating, and adding a trace of dilute perchloride of iron, a magnificent greenish-blue coloration is obtained, which persists for twenty-four hours.

Physically and chemically (1) all the French crystallized digitalines are nearly identical; (2) Homolle and Quévenne's digitaline and the Codex amorphous digitaline are very nearly identical with the German *digitoxine;* (3) German digitalines are quite different from the French. Toxically (1) the crystallized digitalines—either Nativelle's, Homolle and Quévenne's, or Duquesnel's—are substantially alike, from 2 to 3 centigrammes being sufficient to kill a dog weighing twelve to fifteen kilogrammes; (2) the amorphous French digitalines—Codex chloroformic, Homolle and Quévenne's, etc.—have very sensibly the same toxic power; (3) the product sold in Germany under the name of digitoxine, and considered there the most active principle in digitalis, possesses about the same toxicity as crystallized digitalines.

Physiologically digitaline acts as follows: (1) Its absorption is very slow. (2) It is not eliminated by the kidneys; its presence never being detected in urine. (3) It appears to accumulate in no particular organ, at least in the shape of digitaline. All chemical tests failed to detect it in one organ more than in another, after acute or after slow poisoning. (4) It is not sensibly modified in the digestive tube, but possibly may be oxidized in the circulatory organs. (5) Digitaline is with difficulty altered by chemical and physical agents, fermentation, and putrefaction. Two things at least seem clear from M. Lafon's investigations, namely, that German digitoxine and French digitaline are substantially identical, and that German digitaline is a product quite different from either.

The physiological action of *hyoscine*—an alkaloid derived from hyoscyamine—was examined and discussed at a meeting of the Paris Société de Biology (March 19). Messrs. Gley and Rondeau related that hydrochlorate of hyoscine, in the dose of 1 centigramme for a medium-sized dog, has a soporific influence. In larger doses the moderating effect of the pneumogastric nerve on the heart is suppressed, and the same happened in respect to the action of the chorda tympani on the secretion of the submaxillary gland. Clinical experiments with about fifty patients have shown very speedy and powerful mydriatic effects to be obtainable from one drop of a one per cent. solution of hyoscine hydrochlorate. On being questioned by M. Laborde, M. Gley added that hyoscine and atropine greatly differ as regards their my-

driatic action. With hyoscine the maximum dilatation of the pupil is observed after six, or, at most, eight minutes, while with atropine from twelve to twenty minutes are necessary. Besides, physiologically, hyoscine possesses hypnotic properties not found in atropine, except perhaps in very high doses. Another difference, M. Laborde thought, is that the effects of hyoscine are more persistent.

Physiological Properties of Ulexine.—Ulexine is an alkaloid found by A. W. Gerrard in the seeds of the *Ulex Europæus*, common furze or gorse, a thorny plant growing wild in the temperate regions of Europe. In fact, English and French farmers rather consider the bush a nuisance, only fit for the fireplace; while, if Sowerby be believed, Linnæus, on his first visit to England, at the sight of the flowering shrub in Hounslow Heath, fell on his knees, and thanked God for having created a plant so beautiful. The same diversity of opinion appears to prevail in regard to the properties of the alkaloid. The process for preparing ulexine, briefly stated, consists in exhausting with alcohol of eighty-four degrees the coarsely-powdered seeds, evaporating the percolate to syrupy consistence, and washing this extract with successive portions of water. The watery solution, which now contains the alkaloid, is concentrated by evaporation, and shaken with chloroform in the presence of an excess of ammonia. The impure chloroformic solution of the alkaloid being purified by several solutions in acid water and reprecipitations, too well known to here need description, the substance is finally obtained in the shape of crystalline masses, which are colorless, inodorous, and soluble in water. The alkaloid has a bitter, slightly acrid taste. It forms definite and crystallizable salts, of which the hydrochlorate, being very soluble in water, was selected for a series of experiments performed by Dr. Pinet, in Prof. Vulpian's laboratory, under the professor's advice and supervision. The results of the investigation, just published in *Arch. de Physiol.*, No. 2, are the following: To begin with, Dr. Pinet differs from the English opinion that "ulexine is a paralyzer, able to cause clonic convulsions; on the tongue the effect is somewhat like that of cocaine, but less marked."* Ulexine convulsions have been found to much resemble those caused by nicotine. They begin within three minutes after hypodermic administration; after from five to seven minutes the animal is semi-comatose, respiratory motions cease, but the cardiac beatings persist. Ulexine appears to affect, not the muscular, but the nervous system, beginning with the central and ending with the peripheric nervous system.

For a frog weighing thirty grammes (one ounce) 5 milligrammes ($\frac{1}{12}$ of a grain) of ulexine is a lethal dose. The heart-beats become weaker and weaker, and stop in the diastole. A non-mortal dose—1 milligramme—for an animal of the same size brings on convulsions and narcosis; the heart keeps beating, muscular contractility remains intact in all cases, and the local anæsthesia mentioned by English writers, and compared by them to that of cocaine, has never been observed by Dr. Pinet.

With a guinea-pig weighing three hundred and twenty grammes (ten and one-half ounces) 5 milligrammes of ulexine have no effect. It takes 1 centigramme ($\frac{1}{6}$ of a grain) to affect the animal. Somnolence, heaviness, and slight narcosis ensue, and the creature dies asleep, as it were.

Ulexine not an Antidote against Strychnine.—The narcotic properties of ulexine naturally led Dr. Pinet to try whether it is physiologically antagonistic to strychnine. To a limited extent it is, and even but temporarily so. The effects of ulexine are very speedy, so that when administered after strychnine it masks for a while the tetanic action of the first alkaloid, and apparent immunity results. But soon the influence of ulexine vanishes, and strychnine, gradually resuming the mastery, again exerts its usual effects.

And now to turn from the study of therapeutic agents for their own sake to the medicaments recommended for special affections, several novel modes of treatment have been spoken of by French practitioners. Among them may be noticed two remedies for diabetes, and a very simple one for deficient lactation.

Belladonna and Opium in Acute Diabetes.—In a memoir read before the Academy of Sciences at one of its sittings in February (14), Dr. Villemin related a case, unfortunately alone of its kind, but very interesting in itself. It was as follows: On March 11, 1882, a young artilleryman was sent for treatment to the Val-de-Grâce military hospital in Paris. The patient, a tall, stout-limbed young man, complained of failing strength, cramps, muscular pains, and sore throat; his thirst nothing could quench, and his hunger nothing could sate. But the aliments afforded no strength, and the liquids only passed off in

* The English text is not quoted by Dr. Pinet.

the urine, which had become so abundant as to interfere with sleep. Upon analysis, glucose was at once detected, in the proportion of fifty-eight grammes per litre, which, at the rate of fourteen litres and a half voided in twenty-four hours, corresponds to eight hundred and forty-one grammes, or nearly two pounds of glucose.

At first the usual treatment was resorted to, namely, gluten bread, meat, alkalies, abstinence from sugar and starchy foods, etc. But after eight days no improvement had occurred ; the urine still kept at between twelve and fourteen litres ; the proportion of sugar remained nearly the same, and a fatal ending was evidently near, when Dr. Villemin thought of trying on his glucosuric patient the belladonna and opium treatment, which had proved successful with another one suffering from diabetes insipidus.

It was not, however, without some misgivings lest glycemic accidents might be brought on, and therefore great caution was at first observed. On March 20 10 centigrammes (1½ grains) of extract of belladonna and 5 centigrammes (¾ of a grain) of aqueous extract of opium were administered within twenty-four hours, the same being continued to the 27th. On that day the quantity of urine had fallen down to ten litres, and the sugar to forty grammes per litre. The doses were now gradually increased, so that on May 20 they had become 15 centigrammes (2⅓ grains) of each extract. The urine was at that time reduced to between three and four litres a day, with a proportion of sugar varying between two and five grammes per litre. From May 20 the dose was increased to 20 centigrammes (3 grains) ; eight days later the sugar had disappeared altogether. For seventeen days longer the treatment was continued, without any reappearance of glucose being observed. On June 14, the medicines having been suddenly withheld, the sugar within three days reached again sixteen grammes per day. The medication being then resumed, the sugar disappeared as before, and the patient kept well, under its influence, for over five weeks, when bromide of potassium was near the end of August substituted for the narcotic extracts. The relapse was as remarkable as before, and the same effect resulted when either the opium or the belladonna were omitted from the daily dose. Hence Dr. Villemin insists upon the importance of associating the two substances together. On December 15 the patient, having recovered nearly his usual weight and apparent health, insisted upon leaving the hospital. He was discharged, and never heard of again.

Arsenic and Lithia for Diabetes.—At a meeting of the Paris Société de Thérapeutique (February 23) Dr. Martineau recommended the following treatment, with which, he said, he had cured sixty-seven out of seventy patients suffering from arthritic diabetes :

> Carbonate of lithium, 3 grains;
> Arseniate of sodium, $\frac{1}{10}$ grain;
> Carbonic acid water, 2 pints.

Effect the solution under pressure. The effervescing liquid is to be drunk at meals, mixed with claret, and the foregoing dose is to last for at least three meals, being taken at the two principal meals of the day, customary in Paris. No change of diet is necessary. Dr. Martineau's fellow-members—Dr. Dujardin-Beaumetz among them—were somewhat sceptical about the value of the treatment, but it is so simple and easy that it can be given a trial when the patient is not dangerously ill.

Electricity to promote Lactation.—Dr. H. Pierron, a well-known gynæcologist, calls attention to the use of electricity for exciting the mammary secretion when no apparent reason exists for its failing. Without claiming invention, or even priority, he says he was first induced in 1884, upon theoretical grounds, to try it in the case of a lady patient who was anxious to nurse her own child. Although in excellent health, and everything had been done that science could suggest and wealth afford, she was unable to supply the child with enough nourishment. Dr. Pierron was successful in obtaining the desired result by means of the intermittent current of Gaëffe's induction apparatus applied to the mammary glands. The secretion thus secured was abundant and excellent in quality.

Since then the same treatment has been satisfactorily employed in all similar cases, to the exclusion of other means, when lately a difficulty of another sort occurred. A primipara had weaned her baby, but after fifteen days she noticed it was declining and pining for the breast, scarcely touching other food. In the mean time the lactary secretion had ceased, and menstruation resumed its course. The electric treatment was again resorted to, and after four applications full breasts were the result, with an abundance of good milk, and for the last two months everything has been going on to the satisfaction of all concerned.

The mode of operating with Gaëffe's apparatus is as follows: The negative pole, a spheroidal copper or brass cap, is to be applied under the breast. The positive pole, a round copper ball, is then first placed near the nipple, so as to touch the foldings of the skin, thus stimulating the glandular orifices to begin with. The positive pole is next moved around over the whole mammary gland, working from the centre to the periphery, while the negative pole, which it is approaching, follows its motion at the base of the breast. The same operation is to be performed on each breast in succession at one sitting, but the electric current must at first be weak enough to cause no pain on an organ naturally very sensitive. A second application is made at the same sitting with a current slightly stronger, and the whole together must not last more than ten minutes. The performance is to be repeated every twenty-four hours, and four applications are usually sufficient to cause the flow of milk, when it has only been delayed. When the secretion has already been purposely suppressed, the physician should not despair if he has to renew the operation eight times.

To conclude with a piece of news, Dr. Bergeron was yesterday (March 22) elected perpetual secretary of the Academy of Medicine, in place of the late Dr. Béclard. The contest was very close, as Dr. Jaccoud was also a candidate for the office. At the first ballot Dr. Bergeron obtained forty-six votes out of ninety-one, exactly the necessary majority. Great interest was felt in the election. Even M. Berthelot, the present Minister of Public Instruction, had left the ministerial palace, and sat in his seat, whence he recorded his vote like a simple Academician.

ABORTION FOLLOWING THE USE OF PERMANGANATE OF POTASSIUM.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—I was called February 25 to see Mrs. B., aged about 35. She said at her last menstrual period she had flowed only two days, and since then had not felt her usual self. It was time for to be unwell again. A day before she got wet. She was positive that she was not pregnant. She suffered with intense headache, backache, and soreness, slight elevation of temperature, and vomiting.

I gave her morphine for the headache and aconite, not having any permanganate with me. The next day she was somewhat better, and I then left her eight 2-grain capsules of permanganate of potassium, one to be taken three times a day. The first one she vomited, the second and others were retained with difficulty and only by drinking freely of water.

The next day she began to flow, and flowed very freely that night. I saw her the next day.

The cervix uteri was well dilated and something protruding, which was thoroughly removed, and found to be a fœtus a month old. Recovery good.

Although Merrill and Ringer said the permanganate had no action on a gravid uterus, this is not the first case of abortion following its use.

S. B. SPERRY, M.D.

DELAFIELD, WIS.

URTICARIA FROM INDIGESTION.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—Dr. R. L. Hutton, of Prescott, Ark., has a communication in the THERAPEUTIC GAZETTE for March relative to urticaria due to indigestion, which is answered and commented upon by the editors. My experience in this difficulty coincides with the expressed views of the editors of the THERAPEUTIC GAZETTE, and is unlike that of Dr. Hutton, so far as regards his statement that the disorder is confined to the male sex of middle age. I have found that women, without regard to age, are as liable to be attacked as men. Indeed, I am quite positive I have treated more women than men for this difficulty, nor have I had occasion to notice that it is confined to those individuals of a gouty diathesis, who as stated by the editors of the GAZETTE are most likely to suffer. I have a patient at this present writing, whose sudden, distressing, and unexpected, though, fortunately, infrequent attacks, present some interesting features. The patient is a young married woman, aged 23 years. Generally speaking is a healthy, but not robust, woman. Has no history of gout, and is by no means a chronic dyspeptic. At irregular intervals of from two to six months, about an hour following a usual meal, she will be suddenly and without warning attacked with distressing dyspnœa and marked asthmatic symptoms, so that the first time I was called to her I was misled in believing it to be a genuine case of asthma. Within half an hour there is felt a general benumbed sensation over the entire surface of the body, and within a few minutes the urticaria makes its appearance in large elevated irregular blotches

in different parts of the body, showing itself in successive crops. It arises almost instantaneously, first in one place then in another, over the limbs and trunk. The itching is simply unendurable, and the inclination to scratch irresistible. This patient, though exceedingly modest and ladylike, during this stage of the attack became thoroughly indifferent as to position, posture, or exposure of person in order to scratch any offending portion. Is utterly unable to keep quiet in any position an instant, and in every way shows acute suffering. How long this stage would continue is doubtful, but I have always been able to relieve her distressing condition by a prompt emetic. The contents of the stomach vomited is undigested food in large quantities. As soon as emesis is procured, the symptoms and urticaria disappear almost instantly, and five minutes later the patient is perfectly well, without an unpleasant sensation or a sign of the eruption.

H. D. THOMASON, M.D.

ALBION, MICH.

THE USE OF GALVANISM IN THE TREATMENT OF INDOLENT ULCERS.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—I want to say a few words here about a case that my father, Dr. J. Z. Scott, of this place, has been treating during the past winter. It was a case of indolent ulcer, whose history dated back over fifteen years. At the commencement there was a periostitis, which resulted in destruction of tissue, and finally ulceration, and sequestra of bone were thrown out at different times, until finally it seems all the dead bone was thrown off; at least no dead bone or signs of such could be discovered by the usual exploratory methods.

But the general health of the young man, who was about 20 years old, was impaired, and a condition of the body obtained that seemed to encourage a kind of chronic ulceration process. He had been treated by several reputable physicians before he called upon my father, but had not been benefited much.

When my father saw him first, the ulcer, which was situated an inch above the internal malleolus, extending across the leg transversely to the subcutaneous border of the tibia, and internally about two inches, was painful and very tender, but was indolent as to its general characteristics.

The boy could not sleep much at night on account of the severe pain. He was placed on an emulsion of cod-liver oil, syr. hypophosphites, lime and soda, and pancreatic emulsion, in this formula:

℞ Cod-liver oil, ℥iv;
Pancreatic emulsion, ℥ss;
Syr. hypophosphites lime and soda, q.s. ℥vi. M.
Ft. emulsion.

Sig.—A tablespoonful two hours after each meal, and a pill of iron, quinine, and arsenic, with co. ex. of colocynth, as follows:

℞ Acid. arsenic. gr. i;
Ferri subcarb., gr. xxx;
Ex. colocynth. co., gr. xx;
Pulvis piper. nig., gr. xl;
Ex. taraxacum, gr. xxx. M.
Ft. pil. No. 40 in caps.
Sig.—Take one each night.

He used as a local application iodoform ung. and eucalyptus ung., and strapped the parts well with adhesive plaster. He kept up this treatment for several weeks, but never obtained relief until he commenced the use of the galvanic battery. The secretions of the ulcer were noticed to be alkaline, and the negative pole was placed to the ulcer, the positive at some indifferent point, and six cells were taken into the circuit; the séance was prolonged about ten minutes. From that time the ulcer began to get well, and a half-dozen applications ended the case.

He applied the bare silver plate of the negative electrode of the McIntosh galvanic battery directly to the diseased surface. The other treatment was also persevered in. The general health of the young man was improved all the time, but the ulcer never began to undergo healthy changes until the galvanic current was applied to its bare surface.

My father says he is satisfied that it is a useful weapon with which to combat disease of this sort when used intelligently.

FRANK M. SCOTT, M.D.

SCANDIA, KANSAS, March 21, 1887.

Notes and Queries.

THE TREATMENT OF PLACENTA PRÆVIA.

The treatment of placenta prævia is a matter of such importance and obscured by so much diversity of opinion, that we reproduce in full the editorials that appeared on this subject in the *Lancet* for February 25 and March 5, 1887.

Of all the complications of labor, none is more urgent and more serious than hemor-

rhage; and of the causes of hemorrhage none is more important than placenta prævia. The earliest mention of the condition is to be found in the works of Guillemau, in A.D. 1609; and next in those of Mauriceau, A.D. 1668. Their view was that the after-birth was originally situated higher up, but became displaced as pregnancy proceeded, a view which is still extant in the phrase popular among the lower classes and midwives,—"the after-birth slipped." The correct view, that the after-birth is firmly planted in its dangerous position, was first illustrated by the necropsy of a woman who died of placenta prævia, and was dissected by Schaller in A.D. 1709; and this view was first introduced into the text-books by Johann van Hoorn, A.D. 1715, a pupil of Portal. Van Hoorn plainly says that the cause of the dangerous condition is the after-birth, which at the beginning of pregnancy takes its place on or above the os uteri. After Leveret's time the main facts with regard to placenta prævia are found generally current.

To write a historical review of the subject from that time to this would consume too much of our space; moreover, it would show occasional retrogressions in knowledge and understanding. At the present time our knowledge, which not many years ago was thought to be pretty complete, has been somewhat disturbed by the study of the "lower uterine segment," to which a great impulse was given by the suggestive studies of Ludwig Bandl on uterine rupture, pursued by him in search of the explanation of many other problems. Bandl's views, which need not here be given at length, were many times modified by their author, but the result of the discussion and observations which they have excited has been to show that during labor the uterine body becomes differentiated into a retracting and ever-thickening fundus, a stretching and ever-thinning "lowest uterine segment," and the cervix. It is not yet, however, finally settled what is cervix and what is "lower uterine segment." The lowest part of the retracted fundus is felt after labor as the bottom of the hard uterine cricket-ball; below it come the cervix and "lower uterine segment," hanging loose, apparently unretracted and passive, like a piece of flabby hose. The question is not yet settled why, if this lower uterine segment is the site of placenta prævia, *any* woman escapes flooding to death after this complication. Meanwhile it is possible that, though it feels flabby, it may be physiologically retracted to an extent sufficient to control hemorrhage. Having said thus much, we will proceed to be more dogmatic.

And first we would say that the utterances of the text-books on this great subject are most unsatisfactory, being overloaded with detail both as to pathology and treatment, and generally "hedging" each statement with a timidity and uncertainty which appears in the answers of students in examination, and in the treatment of practitioners. It would be worth all the writing which occupies so many pages, and leaves us at the end as uncertain as to the author's views as we were at the beginning, to enunciate a few great propositions, and to get them well absorbed by those whom we have to teach. We will give some of them:

1. The bleeding comes from the placental site.

2. The cause of the bleeding is the detachment of the placenta.

3. The cause of the detachment of the placenta is the expansion of the lower uterine segment, which the placenta is unable to follow.

This will be seen to be equivalent to saying that before labor there is no bleeding. This is generally, but not always, true. We are obliged, therefore, to remark that the beginning of labor is not always synchronous with the beginning of the "first stage" of labor, but begins with the dilatation of the os internum, which may precede the "first stage" by days or even weeks. Also that the bleeding in placenta prævia is often due to the same causes as operate in "accidental hemorrhage," acting, indeed, with additional advantage on account of the low site of the placenta and the consequently heavier column of blood which the utero-placental vessels have to support under these conditions.

Having plainly stated the main great facts, which are worth all the rest put together, and which should be always taught dogmatically and almost like aphorisms, we now proceed to the question of treatment, for a plain statement of which the student looks in vain in even the most recent text-books, and which seems to us capable of at least an attempt at formulation. We would first remark that a certain number of cases of placenta prævia progress favorably to a safe termination, and require no interference. This is, of course, more likely when only part of the placenta is situated on the area of necessary detachment, but it is not unknown where the placenta is central,—that is, implanted across

the os internum. In such cases the child has been known to be born by strong contractions, wearing the placenta like a cap on its head. On this the well-known treatment of Simpson —the complete detachment of the placenta by the hand,—and its modification by Barnes —partial detachment,—were founded. It is to be remarked that Simpson's treatment was founded on an interpretation of the phenomenon which implied that the woman was delivered safely because the placenta was detached, whereas in our opinion such cases only show that the uterus acted with unusual vigor, shortening the dangerous period and producing good retraction, which, as is well known, is the only safeguard against bleeding. Detachment of the placenta apart from vigorous uterine action is only an increased element of danger. But most cases of placenta prævia do require prompt and wise interference, and to wait for their spontaneous termination would be as wrong as to wait for some form of spontaneous explosion or evolution in a cross-birth. Treatment, to be rational, must be founded on the pathology and natural history of diseases; in other words, it must take cognizance of the causes of death with a view to avoiding them, and of the manner in which nature deals with them when she does so successfully. We come, therefore, to enunciate two more great principles:

4. The great dangers of placenta prævia are: (*a*) bleeding before and during labor; (*b*) bleeding after delivery; (*c*) septic processes.

5. The great safeguard against bleeding before, during, and after delivery is uterine retraction.

We come, therefore, to consider how the dangers arise, how they may be avoided, and how retraction may be secured.

The cause of bleeding before and during delivery has already been touched on. It is detachment of the placenta by dilatation of the placental site. The causes of bleeding after delivery are mainly two,—imperfect retraction, and laceration of the cervix and lower uterine segment, which is, of course, unusually vascular. This also predisposes to sepsis. The causes of sepsis are three,—the low situation of the placental site, bringing it nearer to the outer world and nearer to the accoucheur's fingers, lacerations, and perhaps also imperfect retraction of the lower uterine segment. The great object, therefore, with a view to avoiding and controlling hemorrhage, has been to produce uterine contraction and retraction; and to do this directions have been given to empty the uterus as soon as possible. The condition of the cervix, which, though soft, is often loath to dilate (probably in connection with the abnormal position of the placenta, which disorders the polarity), has rendered it impossible in many cases to effect this without forced delivery (*accouchement forcé*), which consists in thrusting in the hand and dragging out the fœtus by the feet. This is a most dangerous proceeding, and generally takes the practitioner out of the frying-pan of ante-partum hemorrhage into the fire of laceration, post-partum hemorrhage, and blood-poisoning.

Delivery by the head is not suitable for cases of dangerous placenta prævia. No aid can be given till the labor is so far advanced as to be practically over so far as the danger of bleeding is concerned. A sixth proposition may now be enunciated:

6. The great treatment for placenta prævia is turning by the feet.

Our readers will perhaps say, "and extraction." But here we must make another statement, namely, that this is usually unnecessary.

7. It is found practically that as soon as turning has been effected and the leg brought down the bleeding ceases.

The explanation usually given for this is that the presenting part plugs the bleeding site; but it is not certain whether this explanation is correct, or whether the arrest of bleeding is not rather due to the retraction which partial emptying of the uterus effects. It follows, therefore, that—

8. After the leg is brought down, the case may generally be left to nature.

We come now to some points in the history of that condition. Internal version requires dilatation of the cervix to an extent implying that labor has advanced to a considerable degree of progress. To wait for this is often impossible, and *accouchement forcé* (forced delivery) was formerly the only alternative.

The first great advance was made in 1860 by Dr. Braxton Hicks, who showed the possibility of turning by the bipolar method when the cervix would admit two fingers, or even one. He expressly pointed out the advantages of early version by this method in placenta prævia, and published a series of cases to illustrate his point. Our Teutonic brethren seem to have read his publications (which are plain enough) without understanding, for the greatest German accoucheurs, Von Hecker and Spiegelberg, opposed and decried bipolar version, but showed that they failed to comprehend it. In the mean while

various methods of treatment were proposed and partly adopted, and Hicks's method seems to have been practically unknown in France and America. Twenty-two years after its publication a serious trial of early bipolar version was made by Hofmeier, a year later by Behm, and a year later by Lomer, all in Berlin. It was then found that the method which an English accoucheur had described and practised in 1860 required twenty-two years and a foreigner to bring it into vogue.

These accoucheurs treated two hundred and thirty-six cases with eight maternal deaths, a mortality of 3.3 per cent. Behm delivered fifty-eight cases consecutively, without a single maternal death. It must be remarked that Hofmeier and Behm treated all their patients themselves, whereas Lomer's cases were treated by nine different assistants. The presence of a skilled operator must of course be discounted in comparing ancient with modern methods, and so must the use of antiseptics. Still, it may be safely said that, after all due allowance is made, the above results have never been nearly reached. The reduction of mortality may be stated as from twenty-four per cent. to three per cent. The method may be described as—*a*. Bipolar podalic version as early as possible. *b*. Extraction by natural forces, or after complete spontaneous dilatation.

It is found, as said above, that the bleeding practically ceases after version and before extraction. As regards the life of the child, delay does not, according to statistics, much impair its chances, which are always bad; and, on the other hand, the great danger of laceration and fatal hemorrhage from it is set aside, while a fertile source of sepsis is also avoided. Other methods are still mentioned in text-books: complete or partial separation of the placenta, rupture of the membranes, and plugging. Rupture of the membranes and evacuation of the liquor amnii is often impossible when the placenta is completely prævia; the other methods have no such brilliant results, and must predispose to sepsis by the fingering of the placental site, and the retention of clots near it which they entail.

In France the use of the plug still holds its own, and the statistics have certainly improved since the introduction of antiseptics. Still, it can show no results like the above, and should not, in our opinion, be the routine practice among medical men. It must, however, be remembered that placenta prævia is one of the conditions which midwives often have to treat, at least temporarily in the absence of the doctor, and that unless these cases are treated properly they die. It is obviously impossible to intrust midwives, on the other hand, with so delicate an operation as bipolar version. For midwives the best treatment will certainly be to plug tightly with antiseptic precautions, washing out the vagina, and plugging, if possible through a speculum, with cotton-wool or gauze rendered aseptic. There is nothing better for plugging than a bandage of corrosive sublimate gauze. The plug excites contractions, controls hemorrhage to a considerable extent (for concealed hemorrhage in placenta prævia is almost unknown), and preserves the membranes for turning by the accoucheur.

In summing up the question of treatment, it must be remembered that cases divide themselves into two principal classes: The first, in which the uterus, so to say, takes matters into its own hands and acts powerfully; in these cases, to temporize and assist labor, as by forceps or rupture of the membranes if they present, will often be sufficient. The second, in which the labor is disordered, the uterus demoralized, and, unless prompt and skilful help is at hand, the tendency is to rapid death. It is these cases about which there should be no two minds with regard to treatment, and it seems to be proved that it may be summed up as (*a*) bipolar version as early as possible, (*b*) extraction actually or practically left to nature.

There is yet a third class of cases, namely, that in which the patient is either moribund or in extreme and urgent peril from flooding, and in which forced delivery by manual dilatation affords the only chance. These cases are exceptional, and it is hardly necessary to add that the operation should be performed with all possible skill and gentleness.

There are several morals to be deduced from the history of placenta prævia. Firstly, the new is not always the true, nor the truth new. The latest improvement may be a retrograde movement, and the "greatest modern triumph" a thing of which the not remote future will be ashamed. We need not illustrate this maxim here; it is a text on which we have preached and shall preach again. To the reader we need only say, in the language of Sir Christopher Wren's epitaph (slightly altered), "Si documentum requiris, circumspice." The verdict of the day is often wrong; each must make up his mind as to what is bad and false and what is good and true. To follow fashion may entail forty (or twenty-two) years' wandering in the wilder-

ness, till it takes a foreigner to conduct us into the promised land. Secondly, it seems possible that even the most intelligent foreigners may fail to understand plain English and decry a practice which they fail to comprehend. In this instance it took twenty-two years for them to comprehend it. Thirdly, English practice is not always the worst, even if unacceptable on the Continent.

It will be seen that the best modern practice agrees with Dr. Braxton Hicks's recommendations in 1860, and that though some of the facts in the pathology of placenta prævia (such as the arrest of hemorrhage after turning and before extraction) were unknown to him at that time, as well as to his contemporaries, his name deserves a prominent place in the history of the affection.

A CASE OF POISONING BY DUBOISINE.

As cases of poisoning by duboisine are somewhat rare, we reproduce the following report by MR. CHARLES M. CHADWICK in the *British Medical Journal* for February 12, 1887:

On July 13, at 11 A.M., H. J. H., aged 75, consulted Mr. T. Pridgin Teale with reference to his eyes. H. J. H. is suffering from slow-forming senile cataract, and on several occasions atropine has been used for purposes of examination. On this occasion, however, two disks, each containing $\frac{1}{200}$ of a grain of sulphate of duboisine, were placed in the eyes. Very shortly afterwards, patient complained of slight giddiness, became very fidgety, and was advised to remain sitting. In about twenty minutes, the pupils being fairly but not fully dilated, the necessary examination took place, H. J. H. standing during the proceeding. A few minutes later, he experienced a decided feeling of weakness and loss of control over the legs, great dryness of mouth, with exceedingly bitter taste. Fancying, however, the fresh air would do him good, he refused to remain, and elected to walk home. He had not gone far before it was evident that persons in the street regarded him as decidedly "under the influence of liquor;" his speech became husky and indistinct; he walked, talked, and behaved like one slightly intoxicated. Later, when at home, the symptoms progressed; complete inability to stand without assistance, or to recognize the position of objects, partly due, no doubt, to paralysis of accommodation, but also due to visual hallucination. For example, the patient would suddenly sit on the ground, imagining a chair was ready to receive him; drop a glass in mid-air instead of placing it on the table; and grasp in the air above his head for his watch which had been taken from him. With difficulty he was got to bed, constant attendance being necessary to keep him quiet; there was incessant movement, with carphology, a suspicious way of glancing beneath the bedclothes and behind the back. A few moments, when left to himself, sufficed for the whole room to be upset; towels, brushes, and shoes were placed in the bed, and boots on the dressing-table; this entertainment ended by a somewhat severe fall on the floor, whence he was unable to raise himself without assistance.

This incessant activity was accompanied by a flow of words, sentences strung together without any apparent connection, a return of memory to things which happened years ago; throughout, an air of fun and humor, the symptoms those of childishness rather than any attempt at violence.

The pulse was slow; the patient, entirely ignorant of what was the matter with him, imagined it was quite dark, whereas it was a bright summer afternoon. Four hours after the commencement, a small injection of morphine was given, and the patient became quieter, dozing apparently for a few seconds at a time. Three hours later he obtained an hour's quiet sleep, and, after some light nourishment, three hours' sleep, after which his mind appeared quite clear again. He was entirely unconscious of all that had passed; a feeling of weight in the head and general upset lasted for several days. The urine, before and after, was normal. The thoughts which such a case as this gives rise to are shortly these: It is known that children bear belladonna better than adults. Do advancing years gradually increase the susceptibility? Eight cases reported by Mr. Nettleship in 1879 would appear to indicate this. Secondly, was the poison absorbed entirely by the conjunctival mucous membrane? The bitter taste in the mouth might possibly be due to a referred sensation. Thirdly, does this susceptibility in old age point to an unpronounced pathological condition, which is liable to result, after a time, in that condition of atrophy and degeneration which is popularly known as "softening of the brain"? And, fourthly, does belladonna-poisoning, which resembles so closely acute alcoholism and post-epileptic delirium in most of its symptoms, ever give rise to those outbursts of violence,—so frequently destructive to life, and so invariably succeeded by entire ignorance of a deed, perhaps of the ghastliest de-

scription,—which render the medico-legal aspect of many so-called criminal cases so profoundly interesting?

POISONING BY HERRING-ROE.

In *La France Médicale* a case is related in which a man was poisoned by eating three hard-roed herrings. The symptoms were a feeling of oppression, vomiting, burning sensation in the œsophagus and stomach, very violent abdominal pains, and dysentery. The attack lasted about forty-eight hours, and could be traced only to the herrings. Cases of this kind are by no means rare. It has long been known that caviare (sturgeon-roe), and the ova of pike, barbel, perch, and other fish, have frequently given rise to symptoms of poisoning in Russia. M. Goertz, a Russian physician, treated three cases of this kind in one family; the patients had eaten hard roe, while the other members of the family who ate the soft roe experienced no inconvenience. Dr. Münchemeier, of Munich, in 1875 reported three cases of poisoning after eating barbel-roe. These cases, which were very severe, were treated with ice and tincture of opium and saffron. Professor Naunyn reported a similar case in Berlin in 1884. Among the numerous cases reported in Russia, herrings appear to have been the cause in only one. According to Huselmann, accidents of this nature, due to caviare of bad quality, are frequent and sometimes fatal among the poorer classes in Russia. It is impossible, according to him, to say exactly what the poisonous element is, and in these cases, as in poisoning by mussels, oysters, and other fish, the idiosyncrasy of the individual must be taken into account.—*The British Medical Journal*, February 12, 1887.

CONVULSIONS FROM IMPACTED FÆCES IN A YOUNG CHILD.

Dr. G. W. Squires, of East Avon, N. Y., writes as follows (*The Medical Record*, February 26, 1887):

On the 15th I was hastily summoned to see a little girl 11 months old, who, the messenger said, was dying in a fit. On my arrival I found the child just recovered from a convulsion, but there was twitching of the muscles and every indication of more convulsions. The thumbs were flexed in the palms; the eyes were wild and squinting. Upon examination I found the abdomen greatly distended, with hard, knotty-looking lumps, which were readily recognized as being in the bowels. The mother made the remark that the child had been "terribly constipated;" that she had given her as much as three teaspoonfuls of castor oil without a movement of the bowels; that she had been in the habit of feeding her on potatoes, cabbage, bread, and, in fact, everything she ate herself. Every few minutes the child would cry out and bend almost double. I at once ordered an injection of warm water and Castile soap, and in ten minutes the bowels moved, bringing away a great quantity of hardened scybala the size of hickory-nuts. The child immediately felt relieved, and soon went to sleep. At the end of an hour she started up with another violent griping pain. Another injection was immediately given, bringing away more fæces covered with mucus. A few grains of comp. licorice powder was given, and the injections were repeated seven times, each time bringing away less hardened dejections, until the last was of quite natural consistency. The fever-thirst and convulsive symptoms disappeared as if by magic, the child asked for playthings, and was more bright and cheerful than it had been for weeks. The mother told me that the night before the convulsion the child had a severe attack of croup, which was undoubtedly of reflex origin. J.

NEW REACTIONS FOR KAIRIN, ANTIPYRIN, AND ANTIFEBRIN.

Kohn, in *Rundschau* (Prag), gives some new reactions for kairin, antipyrin, and antifebrin. A few drops of solution of chloride of iron added to a dilute aqueous solution of kairin produces a violet color, which suddenly changes to brown.

Antipyrin.—1. Chloride of iron changes an aqueous solution, 1 to 100,000, to red. 2. A solution 1 to 100,000 turns blue-green when nitrous acid is added. Concentrated solutions furnish green crystals.

Antifebrin.—This gives no reaction with reagents mentioned. It is decomposed by boiling with solution of potassium, is tested for anilin, and after distilling this off is tested for acetate of potassium.—*National Druggist*, March 4, 1887.

The attention of readers of Dr. Wood's article "On Bergeon's Method of Treating Phthisis" is directed to the advertisements of Whitall, Tatum & Co. and J. W. Queen & Co. We believe the apparatus made by either of these firms will be found to be satisfactory.